United States Circuit Court of Appeals

FOR THE SECOND CIRCUIT.

INTERCHEMICAL CORPORATION,

Plaintiff-Appellant,

v.

SINCLAIR & CARROLL CO., INC.,

Defendant-Appellee.

On Appeal from the United States District Court
for the Southern District of New York.

TRANSCRIPT OF RECORD.

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United States Letters Patent.

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1,439,696	Doughty	Dec. 26, 1922	961
1,450,692	McElroy & Clarke	Apr. 3, 1923	963
1,752,462	Smith	Apr. 1, 1930	967
1,806,965	Clewell	May 26, 1931	969
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UNITED STATES LETTERS PATENT.

Patent Number	Patentee	Date	
1,261,885	Wood, *et al.*	Apr. 9, 1918	993
1,592,806	Brunell	July 13, 1926	998
1,665,185	Brunell	Apr. 3, 1928	1005

BRITISH LETTERS PATENT.

249,472	Ullstein	1926		1013
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United States District Court

SOUTHERN DISTRICT OF NEW YORK

INTERCHEMICAL CORPORATION, Plaintiff, *v.* SINCLAIR & CARROLL CO., INC., Defendant.	Civil Action. No. 15-310.

Prefatory Statement.

1. The complaint was filed August 28, 1941, and charged infringement of United States Letters Patent No. 2,087,190. The only claims of said patent which are in issue in this suit are Claims 3, 10, 11, 12 and 13.

2. The plaintiff-appellant is Interchemical Corporation, an Ohio corporation. The defendant-appellee is Sinclair & Carroll Co., Inc., a New York corporation. There has been no change in the parties since this suit was started.

3. The defendant's answer was filed October 17, 1941, and an amendment to said answer was filed December 14, 1942.

4. The defendant was not arrested, no bail was taken and no property was attached.

5. The trial was held January 18, 19, 20, 21, 22, 25, 26 and 27, 1943, before Honorable J. Foster Symes, Judge of the United States District Court for the District of Colorado, sitting as a Judge in and for the Southern District of New York.

6. No question was referred to a commissioner, master or referee.

7. Final judgment was entered on July 7, 1943.

8. A motion for a new trial was served by plaintiff on defendant on July 13, 1943, and an order denying plaintiff's motion for a new trial was entered on August 30, 1943.

9. Notice of appeal was filed on September 13, 1943.

Complaint.

Plaintiff, for its cause of action, states:

1. This is a cause of action arising under the Patent Laws of the United States.

2. Plaintiff is a corporation organized and existing under the laws of the State of Ohio.

3. On information and belief, defendant is a corporation organized and existing under the laws of the State of New York and having a regular and established place of business and its principal office at 591 Eleventh Avenue, in the Borough of Manhattan, City and State of New York. Acts of infringement hereinafter complained of have been and are still being committed within the Southern District of New York and elsewhere within the United States.

4. Plaintiff is the owner of United States Letters Patent No. 2,087,190 duly and legally granted on July 13, 1937 to International Printing Ink Corporation, New York, N. Y., a corporation of Ohio, the name of which has since been changed to Interchemical Corporation, plaintiff herein.

5. Plaintiff has given defendant written notice of infringement of said Letters Patent.

6. On information and belief, defendant for a long time past has been and still is infringing said Letters Patent by making and selling, without license, printing inks embodying the invention claimed in said Letters Patent, and, unless enjoined by this Court, will continue to do so, causing great and irreparable damage to plaintiff.

Wherefore, plaintiff demands a preliminary and permanent injunction against further infringement by defendant and all those controlled by defendant; an accounting by defendant for profits and triple damages; an assessment of costs against defendant; and such other relief as this Court deems just and proper.

INTERCHEMICAL CORPORATION

By (Sgd) ROBERT W. BYERLY
Its Attorney

August 28, 1941

Of Counsel:
BYERLY, WATSON & SIMONDS,
225 Broadway,
New York, N. Y.

Answer.

Defendant, Sinclair & Carroll Co., Inc., for its answer to the Complaint in the above-entitled cause states as follows:

1. Defendant admits the allegations of paragraph 1 of the complaint.

2. Defendant admits the allegations of paragraph 2 of the complaint.

3. Defendant admits the allegations of paragraph 3 of the complaint, except that defendant denies that it has committed any acts of infringement whatsoever.

4. Answering paragraph 4 of the complaint, defendant admits that United States Letters Patent No. 2,087,190 were issued on July 13, 1937, to International Printing Ink Corporation. Defendant denies that such Letters Patent were "duly and legally issued". Defendant lacks knowledge or information sufficient to form a belief as to the remaining allegations of paragraph 4 of the complaint.

5. Defendant admits the allegations of paragraph 5 of the complaint.

6. Defendant denies the allegations of paragraph 6 of the complaint.

7. Further answering the complaint, defendant avers that said Letters Patent and each and all the claims thereof are invalid and void and of no force and effect because, in view of the prior state of the art and in view of what was common knowledge on the part of those skilled in the art at and prior to the time of the alleged invention of the subject-matter of said Letters Patent by Albert E. Gessler, the alleged inventor named therein, the invention purported to be patented thereby does not constitute patentable invention within the meaning of the Patent Laws of the United States.

Answer.

8. Defendant avers that said Letters Patent and each and all of the claims thereof are invalid and void and of no force and effect because the alleged inventions claimed therein and covered thereby and each and every substantial and material part thereof were, prior to the alleged invention thereof by the said Albert E. Gessler, or more than two years prior to the filing of his application for said Letters Patent, patented or described in each of the following Letters Patent and publications:

UNITED STATES LETTERS PATENT

Patent No.	Patentee	Date
380,654	Lefferts *et al.*	Apr. 3, 1888
410,208	Schupphaus	Sept. 3, 1889
716,318	Wass	Dec. 16, 1902
1,082,099	Putnam	Dec. 23, 1913
1,203,779	Putnam	Nov. 7, 1916
1,439,695	Doughty	Dec. 26, 1922
1,439,696	Doughty	Dec. 26, 1922
1,449,943	Hilton	Mar. 27, 1923
1,450,692	McElroy *et al.*	Apr. 3, 1923
1,471,746	McElroy *et al.*	Oct. 23, 1923
1,618,481	Shipley *et al.*	Feb. 22, 1927
1,618,482	Shipley *et al.*	Feb. 22, 1927
1,621,541	Hopkins	Mar. 22, 1927
1,715,209	Morris	May 28, 1929
1,725,649	Knight	Aug. 20, 1929
1,752,462	Smith	Apr. 1, 1930
1,806,965	Clewell	May 26, 1931
1,858,673	Lawrence	May 17, 1932
1,884,553	Bradley	Oct. 25, 1932
1,924,961	Reese	Aug. 29, 1933
1,954,450	Lawrence	Apr. 10, 1934
1,954,627	Jirousek	Apr. 10, 1934
1,966,907	Schneider	July 17, 1934
2,044,770	Bush	June 23, 1936

BRITISH LETTERS PATENT

Patent Number	Patentee	Date
914	Wass	1912
335,074	Johnson	1930
360,815	Imperial Chem.	1931

AUSTRIAN LETTERS PATENT

124,742	Kurz *et al.*	1931

PUBLICATIONS

"Lacquer Liquids", by Von Huckeroth, Circular No. 359, page 149 (Published January, 1930, by H. A. Gardner)

and many others, and in patents and printed publications which defendant has not as yet ascertained, but prays leave to insert in this answer by amendment as soon as discovered.

9. On information and belief, defendant avers that said Letters Patent and each and all of the claims thereof are invalid and void and of no force and effect because the alleged inventions claimed therein and covered thereby and each and every substantial and material part thereof were in public use in this country more than two years prior to the date of application of said Albert E. Gessler by the aforementioned patentees of the United States Letters Patent listed in paragraph 8 hereof and by:

Alchemic Gold Company, Inc., and American Book Bindery, Inc., and Stratford Press, Inc., all of 75 Varick Street, New York, N. Y., and Sinclair & Valentine Company, 611 West 129th Street, New York, N. Y., and by others at other places, the names and places being at the present unknown to the defendant but which defendant prays leave to insert in this answer by amendment as soon as discovered.

Answer.

10. On information and belief, defendant avers said said Letters Patent and each and all of the claims thereof are invalid and void and of no force and effect because the alleged inventions claimed therein and covered thereby and each and every substantial and material part thereof were, prior to the alleged invention and discovery thereof by Albert E. Gessler, known and used in this country by the aforementioned patentees of the United States Letters Patent listed in paragraph 8 hereof and by Alchemic Gold Company, Inc., and American Book Bindery, Inc., and Stratford Press, Inc., all of 75 Varick Street, New York, N. Y., and Sinclair & Valentine Company, 611 West 129th Street, New York, N. Y., and by others whose names defendant has not as yet ascertained, but prays leave to insert in this answer by amendment as soon as discovered.

11. Defendant avers that said Letters Patent and each and all of the claims thereof are invalid and void and of no force and effect because the description in said Letters Patent of the alleged invention and improvements set forth therein is not in such full, clear and exact terms as to enable any person skilled in the art to which it relates or with which it is most nearly connected to practice, use or operate the alleged invention thereof.

12. That said Letters Patent and each and all of the claims thereof are invalid and void and of no force or effect because the alleged invention or inventions described and claimed therein were and are inoperative and lack utility.

13. Defendant avers that the description contained in in the said Letters Patent are ambiguous and the disclosures therein are not in such full, clear, concise and exact terms as to enable persons skilled in the art to practice the same, and the claims of the patent fail to distinctly point out and distinctly set forth the method and product alleged to be the invention of the said Albert E. Gessler, and further, that for the purpose of deceiving the public the de-

scription and specifications filed in the United States Patent Office were made to contain less than the whole truth relevant to the original alleged inventions.

14. Defendant avers that while the application for said Letters Patent was pending in the United States Patent Office the applicant therefor so limited and confined the claims thereof, pursuant to requirements of the Commissioner of Patents, that plaintiff cannot now seek, have, or obtain constructions of such claims sufficiently broad to cover the product now manufactured and sold by defendant.

WHEREFORE, defendant prays that this Court adjudge and decree that said Letters Patent No. 2,087,190, and all the claims thereof, are invalid and void and of no force and effect and are not infringed by the defendant, and that the complaint herein be dismissed for want of equity, and that the defendant have judgment for the costs of this suit and for such other and further relief as equity may require or as this Court may deem meet and proper.

HOGUET, NEARY & CAMPBELL,
Attorneys for Defendant,
90 Broad Street,
New York, New York.

By (Sgd) WALTER H. FREE,
A member of said firm.

Amendment to Answer.

Now comes Sinclair & Carroll Co., Inc., defendant in the above-entitled cause, by its attorneys, Hoguet, Neary & Campbell, and amends its Answer as follows:

Add the following to Paragraph 8:

UNITED STATES LETTERS PATENT

Patent Number	Patentee	Date
872,777	Wickel	Dec. 3, 1907
1,315,377	McGiehan	Sept. 9, 1919
1,383,512	Barmier	July 5, 1921
1,575,940	Sawyer	Mar. 9, 1926
1,724,644	De Long	Aug. 13, 1929
2,081,949	Mock	June 1, 1937

BRITISH LETTERS PATENT.

295,118	Bain and Nixon	1928
320,410	Norris	1929
337,199	I. G. Farbenindustrie Aktiengesellschaft	1930

FRENCH LETTERS PATENT.

701,597	Magnin	1931

PUBLICATIONS.

"A Summary Of The Chemical Products of The Carbide and Carbon Chemicals Corporation", pages 12, 13, and "Physical Properties" table (Second Edition, published January 1, 1929, by Carbide and Carbon Chemicals Corporation, New York, N. Y.)

"Printing Ink Patents—Their Part In the Development of Ink Manufacture", by Joseph Rossman, pages 23 and 24 of the September, 1930, issue of "The American Ink Maker".

"Custom Built Solvents", Vol. 23, No. 4, page 17 (advertising section), April, 1931, issue of "Industrial and Engineering Chemistry".

"Plastic Inks For Rapid Drying", by M. E. Hanson, December, 1931, issue of "Printing Equipment Engineer", pages 9 and 25.

Amendment to Answer.

Add the following to Paragraph 9:

Charles Eneu Johnson and Company, 2000 Superior Avenue, Cleveland, Ohio, and Evangelical Press, 1900 Superior Avenue, Cleveland, Ohio, in conjunction with the patentee of said patent No. 1,954,627, Joseph F. Jirousek, of 673 East 118th Street, Cleveland, Ohio.

Add the following to Paragraph 10:

Charles Eneu Johnson and Company, 2000 Superior Avenue, Cleveland, Ohio, and Evangelical Press, 1900 Superior Avenue, Cleveland, Ohio, in conjunction with the patentee of said patent No. 1,954,627, Joseph F. Jirousek, of 673 East 118th Street, Cleveland, Ohio.

Add the following paragraph:

15. On information and belief, defendant avers that said Letters Patent in suit are invalid and void and of no force and effect, because the claims thereof here in issue were made more than two years after public sale and use in this country of the alleged invention described in said Letters Patent in suit.

HOGUET, NEARY & CAMPBELL,
Attorneys for Defendant,
90 Broad Street,
New York, N. Y.

By (Sgd) WALTER H. FREE,
A Member of Said Firm.

Service acknowledged this 11th day of December, 1942.

(Sgd) ROBERT W. BYERLY,
Attorney for Plaintiff.

Attorney for plaintiff consents to the filing of the above amendment without the entry of formal order . will raise no objection to the timeliness of the amendment.

(Sgd) ROBERT W. BYERLY,
Attorney for Plaintiff.

Plaintiff's Bill of Particulars.

Now comes Interchemical Corporation, plaintiff herein, by its attorney, and gives the following particulars in answer to the following requests by defendant:

1. Specify the claims of the Gessler Patent No. 2,087,190, in suit, upon which plaintiff will rely at the trial to support the allegation of infringement in the complaint.

Answer: As at present advised, plaintiff will rely on claims 3 and 10 to 15, inclusive.

2. Identify the specific ink or inks alleged to have been sold by defendant upon which plaintiff will rely to support the allegation of infringement in the complaint.

Answer: Inks sold by defendant in February, 1941, to Crowell-Collier, Springfield, Ohio, and called, respectively, Fisher Blue, Cudahy Blue, Fisher Red, Cudahy Red, Fisher Yellow, and Black.

3. Give the date on which plaintiff will rely at the trial as the date of invention of the patent in suit.

Answer: At the trial the plaintiff will not attempt to prove that the invention of the patent in suit was made prior to June 10, 1930.

4. Submit information, including descriptive matter and drawings or photographs, necessary to complete understanding of apparatus and/or process for effecting the step stated in lines 19 to 22, inclusive, column 2, page 2, of the patent in suit, as follows: "At the conclusion of the printing operation, the printed materials may be subjected, in a known manner, to sufficient heat to dry the thin film of the print very rapidly".

Answer: Plaintiff submits copies of the following patents:

Wood U. S. Patent No. 1,261,885,
issued April 9, 1918;
Ullstein British Patent No. 249,472,
published in 1926;
Brunell U. S. Patent No. 1,592,806,
issued July 13, 1926; and
Brunell U. S. Patent No. 1,665,185,
issued April 3, 1928.

5. Submit a certified copy of the complete file wrapper (including all amendments and Patent Office letters) of patent application Serial No. 15,944, filed April 12, 1935, by Albert E. Gessler, and stated in lines 31 to 32 of column 2, page 2, of the patent in suit, to be "in part a continuation of this application", and certified copies of any collateral Patent Office proceedings involving said "continuation" application Serial No. 15,944; or, in the alternative, at plaintiff's option, provide defendant's attorneys with written permission to inspect and make copies of the said "continuation" application Serial No. 15,944, and any said collateral proceedings involving the same.

Answer: A permit to inspect and make copies has been furnished to counsel for defendant by counsel for plaintiff.

6. State the meaning of the terms "liquid component" and "solid component" as used in the claims in suit.

Answer: Plaintiff, as at present advised, will contend at the trial that the term "liquid" in the patent in suit means any substance or substances that pour at room temperatures, and that the term "solid" in the patent in suit means any substance or substances that are non-pouring at room temperatures.

7. State the meaning of the word "stable" as used in claim 12 of the patent in suit.

Answer: Plaintiff, as at present advised, will contend at the trial that the word "stable" is used in claim 12 of the patent in suit in accordance with its ordinary meaning, viz., unchanging.

8. Furnish to defendant a true copy of each written license issued by plaintiff under the patent in suit.

Answer: A copy of each such license has been furnished to counsel for defendant by counsel for plaintiff.

(Sgd.) ROBERT W. BYERLY
Counsel for Plaintiff

Dated: New York, New York, December 11, 1942.

Defendant's Bill of Particulars.

Now comes Sinclair & Carroll Co., Inc. the defendant herein, by its attorneys, and gives the following particulars in answer to the following requests by plaintiff:

1. Specify all patents and publications which will actually be relied upon by defendant on the trial of this case to show the state of the prior art and common knowledge referred to in Paragraph 7 of the defendant's answer to the complaint.

Answer: Defendant, as at present advised, will rely at the trial on the following as indicative of the state of the art and common knowledge prior to the effective date of the patent in suit:

Patent Number	Patentee	Date
410,208	Schupphaus	Sept. 3, 1889
872,777	Wickel	Dec. 3, 1907
1,315,377	McGiehan	Sept. 9, 1919
1,383,512	Barmier	July 5, 1921
1,724,644	De Long	Aug. 13, 1929
1,806,965	Clewell	May 26, 1931
1,884,553	Bradley	Oct. 25, 1932
1,954,450	Lawrence	Apr. 10, 1934
2,081,949	Mock	June 1, 1937
(British) 320,410	Morris	1929
(British) 337,199	I. G. Farbenindustrie	1930
(French) 701,597	Magnin	1931

Defendant's Bill of Particulars.

PUBLICATIONS.

"A Summary Of The Chemical Products Of The Carbide and Carbon Chemicals Corporation", pages 12, 13, and "Physical Properties" table (Second Edition, published January 1, 1929, by Carbide and Carbon Chemicals Corporation, New York, N. Y.)

"Printing Ink Patents—Their Part In the Development of Ink Manufacture", by Joseph Rossman, pages 23 and 24 of the September, 1930, issue of "The American Ink Maker"

"Custom Built Solvents", (Vol. 23, No. 4, page 17 advertising section), April, 1931, issue of "Industrial and Engineering Chemistry"

"Plastic Inks for Rapid Drying", by M. E. Hanson, December 1931 issue of "Printing Equipment Engineer", pages 9 and 25.

3. Which of the patents and publications referred to in Paragraph 8 of the defendant's answer to the complaint will actually be relied upon by defendant on the trial of this case to anticipate the patent in suit?

Answer: Defendant, as at present advised, will rely at the trial upon the following patents in support of its allegation in the answer herein of anticipation of the patent in suit:

Patent Number	Patentee	Date
380,654	Lefferts and Stevens	Apr. 3, 1888
1,439,696	Doughty	Dec. 26, 1922
1,450,692	McElroy and Clarke	Apr. 3, 1923
1,752,462	Smith	Apr. 1, 1930
1,954,627	Jirousek	Apr. 10, 1934
(British) 295,118	Bain and Nixon	Aug. 9, 1928

3. Which of the alleged instances of prior use referred to in Paragraphs 9 and 10 of the defendant's answer to the

complaint will actually be relied upon by defendant on the trial of this case?

Answer: Defendant, as at present advised, will rely at the trial upon the following to show knowledge and use of the subject-matter of the patent in suit prior to the effective date thereof:

Alchemic Gold Company, Inc., New York, N. Y.
Sinclair & Valentine Co., New York, N. Y.
Joseph F. Jirousek, Cleveland, Ohio, and
Charles Eneu Johnson and Company, Cleveland, Ohio, and Evangelical Press, Cleveland, Ohio.

4. With respect to the alleged Alchemic Gold Company, Inc. prior knowledge and use specified in the answer to request No. 3 hereof, state:

(a) Each date when the use is alleged to have occurred.

Answer: From 1921 to date.

(b) The name and address of each person alleged to have knowledge thereof:

Answer: Howard W. Doughty, Amherst, Mass. Sidney Satenstein, 431 Canal Street, New York, N. Y.

(c) Each address at which the use is alleged to have occurred:

Answer: Alchemic Gold Company, Inc., and Stratford Press, at 406-426 West 31st Street, New York, N. Y.

(d) The ingredients of the material alleged to have been used and the proportion of each ingredient:

Answer: One such ink was composed of the ingredients mixed approximately in the proportions and in the manner described between lines 38 and 51 of page 2 of Doughty patent No. 1,439,696, issued to Alchemic Gold Company, Inc. Another such ink was composed of the ingredients mixed approximately in the proportions and in the manner described between lines 16 and 46 of page 2 of McElroy and Clarke patent No. 1,450,692, issued to Alchemic Gold Com-

pany, Inc. Another such ink was composed of the following ingredients mixed in the following approximate proportions: Three parts vehicle (comprising four parts terpineol and one part ordinary rosin), two parts rosin oil, one part ordinary rosin, and twelve parts pigment.

(e) With respect to each liquid ingredient of the material alleged to have been used, its chemical composition, its boiling range, the source from which it was obtained and the number or other designation by which it was identified by the supplier:

Answer: The solvent used was commercial terpineol, obtained from Antoine Chiris Company, Inc., 115 East 23rd Street, New York, N. Y., and had a boiling point of about 218° C. Terpineol is a hydrocarbon oil having the chemical formula $C_{10}H_{18}O$. The rosin oil was a commercial product obtained on the open market from a source not now known to defendant's attorney, who is, however, informed that it probably was obtained from said Antoine Chiris Company, Inc. According to Hackh's Chemical Dictionary, Second Edition (1937), the boiling point of rosin oil is 280° C., and its chemical formula is $C_{32}H_{16}$.

(f) The mode in which the alleged use was practiced and whether the material alleged to have been used was printed at room temperature and immediately thereafter dried or set by subjecting it or the material upon which it was printed to elevated temperatures:

Answer: The ink was printed on sheet material, including book cover material and paper, both sized and unsized, with the application of heat during printing to dry or set the printed ink, and the ink was also printed on paper at room temperature and subsequently dried.

(g) Whether the composition of the material alleged to have been used is set forth in any records, and, if so, describe each such record in detail and state the name and address of the person or persons having the custody or control thereof:

Answer: Said Doughty patent No. 1,439,696, and McElroy and Clarke patent No. 1,450,692, and formula records in custody of said Howard W. Doughty and said Alchemic Gold Company, Inc.

5. With respect to the alleged Sinclair & Valentine Company prior knowledge and use specified in the answer to request No. 3 hereof, state:

(a) Each date when the use is alleged to have occurred:
Answer: From 1921 to date.

(b) The name and address of each person alleged to have knowledge thereof:
Answer: George Kramer, c/o Sinclair & Valentine Co., 611 West 129th Street, New York, N. Y.
Charles Ziemann, c/o Sinclair & Valentine Co., 611 West 129th Street, New York, N. Y.
Harvey U. Locke, 755 Anderson Avenue, Cliffside Park, New Jersey.
Oliver Wolcott and Carl C. Barnes, c/o Southgate Press, Boston, Mass.
Fred Wykoff, c/o Harris & Partridge, Philadelphia, Pa.

(c) Each address at which the use is alleged to have occurred:
Answer: Southgate Press, Boston, Mass.
Harris & Partridge, 525 Locust Street, Philadelphia, Pa.

(d) The ingredients of the material alleged to have been used and the proportion of each ingredient:
Answer: Rotary Pictorial News 7496 Quick Dry, first sold by Sinclair & Valentine, August 23, 1921.

Pigment and dye	15.65%
Solvent (SONY 885 Ink Oil 72.8%, Kerosene 27.2%)	36.15%
Resin	38.71%
Other ingredients	9.49%
	100.00

Black Winter 66114, new, first sold by Sinclair & Valentine, January 13, 1923.

Pigment and dye	27.2 %
Solvent (90% Sony 885 Ink Oil, 10% Sony Kerosene)	22.3 %
Resin	30.7 %
Other ingredients	19.8 %
	100.00

Southgate Black 88020, first sold by Sinclair & Valentine, March 13, 1928.

Pigment and dye	21.05%
Solvent (73.4% Sony 885 Ink Oil, 26.6% Sony Kerosene)	31.75%
Resin	35.39%
Other ingredients	11.81%
	100.00

Composition Southgate Black 88378, first sold by Sinclair & Valentine April 9, 1928.

Pigment and dye	22.47%
Solvent (85.2% Sony 865 Ink Oil, 6.5% 885 Sony Ink Oil, 8.3% Sony Kerosene)	27.91%
Resin	37.21%
Other ingredients	12.41%
	100.00

(e) With respect to each liquid ingredient of the material alleged to have been used, its chemical composition, its boiling range, the source from which it was obtained and the number or other designation by which it was identified by the supplier;

Answer; "Sony" 885 Ink Oil, is a petroleum fraction having a boiling range from 575° F. (302° C) to 700° F.

(371° C.) and was supplied by Standard Oil Company of New York.

"Sony" 865 Ink Oil, is a petroleum fraction having a boiling range from 590° F. (310° C.) to 740° F. (393° C.) and was supplied by Standard Oil Company of New York.

"Sony" kerosene, is a petroleum fraction, having a boiling range from 340° F. (172° C.) to 550° F. (287° C.) and was supplied by Standard Oil Company of New York.

(f) The mode in which the alleged use was practiced and whether the material alleged to have been used was printed at room temperature and immediately thereafter dried or set by subjecting it or the material upon which it was printed to elevated temperatures.

Answer: The ink was printed at room temperature and immediately thereafter the print was subjected to heat to dry and set ink.

(g) Whether the composition of the material alleged to have been used is set forth in any records and, if so, describe each such record in detail and state the name and address of the person or persons having the custody or control thereof.

Answer: Ink compounders formula cards in custody of Sinclair & Valentine Co., 611 West 129th Street, New York, N. Y.

6. With respect to the Jirousek Evangelical Press, and Johnson Company prior knowledge and use specified in the answer to request No. 3 hereof, state:

(a) Each date when the use is alleged to have occurred:

Answer: 1928 to April, 1932.

(b) The name and address of each person alleged to have knowledge thereof:

Answer: Joseph F. Jirousek, 673 East 118th Street, Cleveland, Ohio.

Charles Theuer, 2000 Superior Avenue, Cleveland, Ohio.

Frank Pellinger, 4223 West 56th Street, Cleveland, Ohio.

Ed. Beres, 130-10 Soika Avenue, Cleveland, Ohio.
Lewis Nichols, 17416 Oxford Avenue, Cleveland, Ohio.

(c) Each address at which the use is alleged to have occurred:

Answer: Evangelical Press, 1900 Superior Avenue, Cleveland, Ohio.

Charles Eneu Johnson and Company, 2000 Superior Avenue, Cleveland, Ohio.

(d) The ingredients of the material alleged to have been used and the proportion of each ingredient.

Answer: As to inks prior to 1931, defendant's counsel is not now informed as to composition and proportions but when ascertained the information will be given promptly to plaintiff's counsel. As defendant's counsel is at present advised, the inks of 1931-1932 had the approximate composition and proportions set forth as the example in Jirousek patent No. 1,954,627, page 1, lines 53 to 70.

(e) With respect to each ingredient of the material alleged to have been used and chemical composition, its boiling range, the source from which it was obtained, and other information by which it was identified by the supplier:

Answer: The 1931-1932 inks described in answer to (d) hereof were made up of the ingredients named as obtained on the open market, from sources not presently known to defendant's counsel. Benzyl alcohol, specified as the solvent, has a boiling point of 204.7° C., according to Hackh's Chemical Dictionary, Second Edition (1937), and kerosene has a boiling range of approximately 172° to 287° C., according to Standard Oil Company of New York specifications.

(f) The mode in which the alleged use was practiced and whether the material alleged to have been used was printed at room temperature and immediately thereafter dried or set by subjecting it or the material upon which it was printed to elevated temperatures:

Answer: The ink was printed on paper at room temperature and immediately thereafter the print was subjected to heat to dry or set the ink.

(g) Whether the composition of the material alleged to have been used is set forth in any records and, if so, describe such record in detail and state the name and address of the person or persons having the custody or control thereof.

Answer: Jirousek patent No. 1,954,624, and formula records in custody of said Joseph F. Jirousek and said Charles Eneu Johnson and Company.

7. Specify each respect in which the description in the patent in suit will be claimed by defendant on the trial of this case to be defective as alleged in Paragraph 11 of defendant's answer to the complaint.

Answer: The patent in suit does not disclose a printing ink having the properties described in the specification thereof.

8. Specify each respect in which the invention of the patent in suit will be claimed by defendant on the trial of this case to be inoperative and lacking in utility as alleged in Paragraph 12 of the defendant's answer to the complaint.

Answer: The ink described by the patent in suit (1) is not stable (unchanging) on the printing press, and (2) deteriorates ink-distributing rollers as stated in patent No. 2,128,672, issued to plaintiff as assignee of Albert E. Gessler.

9. Specify each respect in which the description and disclosures contained in the patent in suit will be claimed by defendant on the trial of this case to be defective as alleged in Paragraph 13 of defendant's answer to the complaint.

Answer: The patent in suit does not disclose a printing ink having the properties described in the specification thereof.

Defendant's Bill of Particulars.

10. Specify each respect in which the claims of the patent in suit will be claimed by defendant on the trial of this case to be defective as alleged in Paragraph 13 of defendant's answer to the complaint.

Answer: The claims in suit do not define the printing ink described in the specification of the patent in suit.

11. Specify each respect in which the defendant will claim on the trial of this case that the patent in suit was made to contain less than the whole truth relevant to the invention of the patent in suit as alleged in Paragraph 13 of the defendant's answer to the complaint.

Answer: The matter between line 9, column 1, line 2, column 2, page 1, of the patent in suit, is not an accurate or entire description of art prior to the filing date of the patent in suit.

12. Specify each respect in which the defendant will claim on the trial of this case that the prosecution of the application for the patent in suit requires a construction of the claims thereof which is not sufficiently broad to cover the product manufactured and sold by defendant as alleged in Paragraph 14 of defendant's answer to the complaint.

Answer: Plaintiff is estopped by the prosecution of the application for the patent in suit from claiming that the claims in suit cover defendant's accused inks, because, prior to amendment "G" filed October 10, 1935, the application for the patent in suit contained broad claims which were relinquished by plaintiff on said date pursuant to rejection thereof by the Commissioner of Patents and were eventually replaced by claims not sufficiently broad to cover the defendant's product charged by plaintiff to infringe the patent in suit.

HOGUET, NEARY & CAMPBELL,
Attorneys for Defendant.

By (Sgd.) WALTER H. FREE.

Dated: New York, N. Y., December 11, 1942.

Minutes of Trial.

Before:

HON. JOHN FOSTER SYMES,

District Judge.

New York, January 18, 1943,
10:30 o'clock a. m.

Appearances:

ROBERT W. BYERLY, Esq., Attorney for Plaintiff; ROBERT W. BYERLY, Esq., and RALPH M. WATSON, Esq., of Counsel.

HOGUET, NEARY & CAMPBELL, Esqrs., Attorneys for Defendant; WALTER H. FREE, Esq., and JOHN F. NEARY, JR., Esq., of Counsel.

(28)* PRIMA FACIE PROOFS.

Mr. Byerly: I offer some exhibits. The first is a stipulation as to proofs, which is the usual stipulation permitting use of copies of patents (29)* and publications. The stipulation also admits the corporate status of the parties and refers to the change in name of the plaintiff, which was originally called International Printing Ink Company and is now called Interchemical Corporation.

(Marked Plaintiff's Exhibit 1.)

Mr. Byerly: Next I shall offer as Exhibit 2 the patent in suit. Has your Honor a copy of the patent?

The Court: I have one here.

(Marked Plaintiff's Exhibit 2.)

Mr. Byerly: The patent shows on its face that it was issued to The International Printing Ink Corporation, which is the former name of the plaintiff, so there is no need of proof of title. But I should like to offer assignment from Zinsser & Company to the plaintiff, dated April

* Parenthesized numbers in the text refer to the pages of the trial minutes.

2, 1935. That may be of some relevance in showing the date on which the plaintiff obtained title to the application on which the patent was issued.

(Marked Plaintiff's Exhibit 3.)

Mr. Byerly: I should now like to offer the defendant's answers to plaintiff's interrogatories 1 to 5 and 8 to 12. Those are on file, and I do not know whether your Honor would like to have them read or what (30) would be the best way——

The Court: What are they?

Mr. Byerly: These are the answers to plaintiff's interrogatories.

The Court: Just file them and I will read them.

Mr. Byerly: They are already on file.

Do you have the file here, Mr. Clerk?

The Court: You referred to certain of these interrogatories or do you want all of them?

Mr. Byerly: Your Honor, I would like to offer 1 to 5 and 8 to 10. They might be deemed marked Plaintiff's Exhibit 4.

(Deemed marked Plaintiff's Exhibit 4.)

The Court: Well, there are two sets of answers here. 1 to 5 is referred to in the first paper; and the second you say is 8 to 10?

Mr. Byerly: Are there two sets, your Honor?

The Court: I do not know whether they are duplicates or not—no, they are not.

Mr. Byerly: Perhaps one relates to a bill of particulars and the other to interrogatories, as I remember it.

The Court: You pick out the ones which you want the Court to pay attenion to.

Mr. Byerly: These are the ones that I am (31) offering. These are defendant's answers to plaintiff's interrogatories. The defendant's answers to plaintiff's interrogatories I am offering are 1 to 5 and 8 to 10.

The Court: Very well.
Mr. Byerly: I will call Mr. Bradgon.

CHARLES R. BRAGDON, called as a witness on behalf of the plaintiff, being duly sworn, testified as follows:

Direct examination by Mr. Byerly:

Q. Mr. Bragdon, you are a chemist employed by the plaintiff? A. I am.

Q. Will you state briefly your education as a chemist and your previous activities as a chemist? A. Graduate of Northwestern University and of Massachusetts Institute of Technology——

The Court: Is it necessary to have these witnesses qualified or will their qualifications be admitted?

Mr. Free: I will admit it. Maybe Mr. Byerly wants to make an appeal record.

The Court: All right.

Mr. Byerly: It won't take but a moment.

The Court: Go ahead, then.

A. (Continuing) I was employed by Robert A. Worstall, a consulting chemist to the paint, varnish (32) and printing ink industries from 1909 to 1915, with an interval of a year and a half when I was chief chemist of the Glidden Varnish Company, Cleveland.

Since 1915 I have been with the plaintiff or associated companies. For 18 years I was with the Ault & Wiborg Company as chemical director of the varnish works. In 1934 I was transferred to the research laboratories of Interchemical Corporation, which is the parent company.

The Court: The plaintiff here?

The Witness: The plaintiff, yes, your Honor. That is the parent company of Ault & Wiborg.

Q. Have you read and do you understand the patent in suit, Mr. Bragdon? A. I have and I do.

Q. I notice in the patent in a number of places the expression "vapor pressure" occurs.

Mr. Byerly: If your Honor will permit I will hand the witness a copy of the patent. It may be convenient (handing to witness).

Q. (Continuing) Can you tell us what the expression "vapor pressure" means? A. It is a characteristic of liquids which regulates the evaporation of portions of the liquid changing from a liquid into the gaseous state. The molecules of liquids are commonly supposed to be in rapid motion and as they come to the surface of the liquid some of them escape into the space above (33) the liquid.

The Court: Is that what evaporation is, the escape of these molecules?

The Witness: That is it.

The Court: All right.

A. (Continuing) The tendency of these molecules to escape depends partly on the chemical character of the liquid itself and partly on the temperature. As the temperature would rise the molecules are in more rapid motion and more of them tend to escape into the space above the liquid.

By the Court:

Q. It depends on two things, on the temperature and—what was the other? A. On the chemical composition of the liquid itself. Each liquid, each pure chemical liquid has its own characteristic vapor pressure at any given temperature. The vapor pressure is produced by the bombard-

ment of these molecules in the space above the liquid against the walls of the vessel in which it may be confined.

Q. Well, the atmosphere might act as a wall, wouldn't it? A. The atmosphere tends to hold these molecules down there.

Q. Just like a wall or container? A. Very much like a wall, although in time the particles will be diffused (34) through the air. As the temperature is raised the more rapid motion of these molecules causes the vapor pressure to increase.

Q. The temperature increases the motion of molecules? A. Yes.

The Court: All right, go ahead.

A. (Continuing) That is the general explanation of vapor pressure.

By Mr. Byerly:

Q. If a liquid is actively boiling how is its vapor pressure? A. Its vapor pressure is then equal to the pressure of the atmosphere above it.

Q. In what units is vapor pressure measured? A. It is measured either in inches, in centimeters or in millimeters. The ordinary pressure of the atmosphere is about 30 inches or about 76 centimeters or 760 millimeters.

Q. And that being the measurement obtained from a column of mercury in a barometer? A. That is right. The column of mercury exactly balances the pressure of the air on the surface of the mercury in the dish in which the barometer is inserted.

Q. Vapor pressure is usually measured in that same terminology, that is, in inches or centimeters, meaning the equivalent column of mercury? A. That is correct.

(35) Q. Then is it correct to say that the vapor pressure of a liquid is about 76 centimeters when the liquid is

actively boiling at atmospheric pressure, at ordinary atmospheric pressure? A. That is right.

Q. The patent refers, near the bottom of page 1, to diethylene glycol monobutyl ether as an example of a peculiar class of solvents.

The Court: Where is that?

Mr. Byerly: That is at the very end. It is the last three lines on page 1 of the patent:

"Among this peculiar class of solvents I have found as an example diethylene glycol monobutyl ether."

Q. (Continuing) Are you familiar with this solvent, Mr. Bragdon? A. I am.

Q. What is its ordinary commercial name? A. Butyl carbitol.

Q. Tell us about its vapor pressure characteristics. A. It has three special characteristics. The vapor pressure at room temperature is very low. It is given by Brewer and Gardner, who are consulting chemists in Philadelphia, in a paper which they published several years ago as .02 of a millimeter, at 20 degrees Centigrade. The vapor pressure increases rapidly when the liquid is heated and at about 150 degrees Centigrade (36) it is in the order of centimeters, about 6 centimeters. The third characteristic is that as the evaporation of butyl carbitol proceeds the vapor pressure remains nearly constant. That is because butyl carbitol is a pure, a nearly pure chemical substance, a definite chemical compound, and those compounds are characterized by having a uniform vapor pressure, and no matter whether you have a large amount present or a small amount present the vapor pressure remains at the same figure.

Q. Let us consider for a moment these three characteristics separately. You have said that at room temperature the vapor pressure is very low. The patent itself states

at line 68, page 2, column 1—it gives the vapor pressure as .02 of a millimeter, stating that that is taken from Brewer and Gardner's measurements, does it not? A. It does.

Q. In the first place have you looked at the Brewer and Gardner article? A. Yes.

Q. Is that correctly stated? A. That is correctly stated.

Q. Do you know of any other measurements which tend to confirm or contradict that figure? A. The manufacturer of butyl carbitol, the Carbide & Carbon Chemicals Corporation, have published the figures showing that the vapor pressure of butyl carbitol at 20 degrees is about .05 of a (37) millimeter, which is a little higher than this figure given here. It is very difficult to make measurements of such very small differences in pressure accurately at room temperatures, and most of these measurements are made by determining the vapor pressure at somewhat higher temperatures where it is large enough to be measured more accurately and then drawing a curve through a series of points which will usually lie on the definite line and continuing the line to a 20 degree point and determining the figure in that way.

Q. In view of this impossibility of measuring directly, accurately, would it be correct to say that the various measurements which you have considered and seen indicate that the vapor pressure is certainly on the order of hundredths of a millimeter, 20 degrees? A. It is in that general range, very, very small, about a hundredth of a millimeter.

Q. While you are not a printer I suppose you have seen a printing press in operation? A. I have.

Q. Do you know how the ink is applied to the type or to the printing cylinder? A. It is fed into a fountain, a sort of a trough from which it is taken by rollers. The first rollers turn rather slowly and they pass along some of the ink to secondary distributing rollers which are turning a little faster and some of them (38) are also moving back and forth in the direction of their axis. There is a series of——

The Court: One picks up the ink and then the other coming in contact with it takes ink off it?

The Witness: That is right.

The Court: At the same time it is moving——

The Witness: Lengthwise.

The Court: Lengthwise?

The Witness: Yes. There may be a train of 12 to 15 or 18 such rollers before the ink is brought to the plate which carries the type. The film of ink gradually becomes thinner and thinner and more uniform as it is gradually brought to the plate.

Q. Have you any idea of the thickness of the film on the rollers, say getting towards the type but has not quite got to it? A. It is very thin. The measurements that we have made in our laboratories indicate that it would be on the order of about a thousandth of an inch, about 20 microns.

Q. What is a micron? A. A micron is one-thousandth of a millimeter.

Q. How does a film of that thickness compare with the thickness of an ordinary piece of paper? A. Well, that is about 1/15th or thereabouts of the thickness of a piece of paper.

(39) Q. So it is a very thin film? A. Very thin indeed.

The Court: These are metal rollers, aren't they?

The Witness: A few of them are metal but many of them are either rubber or rubber composition or glue and glycerin, depending on the type of press that is used.

The Court: What is the idea of having that movement on the axis of the roller, to scrape ink along?

The Witness: To scrape the ink along and make the ink more uniform. It may be that there might be a low place in one of the rollers, for instance, that takes the ink from the fountain, which would pick up a very much larger volume of ink at that place, and

by having this motion lengthwise the ink film is made more uniform, spread out.

Q. I notice that the patent on page 2, beginning with the first paragraph, in the second column says, at line 17:

"With ink prepared as above, the printing operation may be carried out in the ordinary manner and at ordinary temperatures."

The ink referred to is one which contains the solvent butyl carbitol, which you have mentioned. Does that statement in the patent, in view of what you know about butyl carbitol, give you any indication of how, if at all, butyl carbitol will evaporate from a film of ink which, (40) as you have said, on the rollers is only about 20 microns thick? A. It would evaporate very slowly. It would probably be still soft after half an hour or an hour.

Q. If that were not so you could not print in the ordinary manner at ordinary temperatures with this ink, could you? A. No. It would be apt to get sticky and stop the press.

Q. Consequently, the patent indicates that an ink with a vapor pressure as low as that of butyl carbitol at 20 degrees, that is, at room temperature, does not evaporate from these thin films when on the press, is that correct? A. That is correct.

Q. Now let us take up the second feature of the vapor pressure of butyl carbitol which you mentioned, that the vapor pressure rises very rapidly with a moderate increase in temperature.

Mr. Byerly: I will ask the clerk to mark this paper for identification so that we can refer to it.

(Marked Plaintiff's Exhibit 5 for identification.)

Q. I will show you a paper containing some graphs which has been marked Plaintiff's Exhibit 5 for identifica-

tion. One of the lines on that paper is marked "butyl carbitol". Does that indicate the vapor pressure of butyl carbitol at different temperatures (handing to witness)? A. It does.

(41) Q. I have another copy here if you would like to place the original before the Court.

(Original handed to Court by witness.)

A. The heavy curved line to the left gives the data determined by vapor pressure measurements of butyl carbitol at various temperatures from ordinary temperatures on up to 150 degrees Centigrade. This is on a scale which does not permit the 150-degree reading to appear, but it would come at a point about 6 centimeters.

The Court: When you speak of pressure that is an expansive pressure you are talking about?

The Witness: Yes.

Q. Does the scale of this graph permit showing what the vapor pressure of butyl carbitol is at room temperature, 20 degrees Centigrade? A. No, it does not. The scale is not big enough to permit that to be shown. It is so near zero that you cannot see the difference.

Q. I call your attention to a statement in the patent which occurs near the top of the first column on page 2, beginning at line 4, and referring to butyl carbitol the patent says:

> "When heated to about 100° C. or above, the rate of vaporization is greatly accelerated and, when used in the ink of this invention, produces a print which dries almost instantaneously when (42) subjected to such a heat treatment."

The ink which is placed on paper in printing is a rather thin film, is it not? A. It is very thin.

Q. Have you any measurement which gives some idea as to how thick that film is? A. It is very hard to measure accurately, but it is in the order of 2 to 4 microns, which would be about 1/15,000ths of an inch.

Q. According to your graph what is the vapor pressure of butyl carbitol at 135 degrees Centigrade? A. At 135 it is about 3½ centimeters.

Q. What is it at 140? A. At 140 it is about 4 centimeters.

Q. How does that compare with the vapor pressure of alcohol at room temperature? A. Vapor pressure of alcohol at room temperature is about 4 centimeters, so that it would be just about the same as butyl carbitol at 140 degrees.

Q. I have called your attention to the statement in the patent beginning at line 4, page 2, where it is stated that when an ink containing butyl carbitol, that is, when a print of an ink containing butyl carbitol is heated to about 100 degrees Centigrade or above the print dries almost instantly. Is there any way you can illustrate the drying of a print when the vapor pressure of the solvent in the ink is, say, 4 centimeters, (43) the same as that of ethyl alcohol? A. Yes. I have had prepared an ink which consists of a pigment ground in a vehicle consisting of nitrocellulose and resin in alcohol, ordinary alcohol. That is purely for illustrative purposes. It is not a practical printing ink but it will illustrate how the ink will behave when the solvent has a vapor pressure of 4 centimeters.

Q. This is not the ink described in the patent? A. It is not the ink described in the patent but it is similar to it except for the solvent.

Q. This ink, if I understand you correctly, should illustrate how the patented ink behaves, how the specific ink mentioned in the patent behaves when it is heated up to 135 degrees Centigrade? A. That is correct.

By the Court:

Q. The reason you use a solvent is in order to take the liquid out of the ink? A. Yes, sir.

Q. To make it flow? A. The resin is a solid material, and in order to make it liquid you have to use the solvent.

Q. And this butyl carbitol is a solvent? A. Butyl carbitol is a solvent. It is a water-white liquid.

Q. Used by the plaintiff? A. Used by the plaintiff, yes, sir.

By Mr. Byerly:

Q. Now using this ink made with the solvent which has (44) a vapor pressure of 4 centimeters at room temperature will you please demonstrate to the Court how it would dry?

The Court: And the drying process means getting rid of the solvent?

The Witness: Yes.

The Court: Leaving the residue?

The Witness: Yes.

The Court: Which makes the impression?

The Witness: That is correct.

A. I smear a little of the ink here on the paper; take this knife and draw it down to a very thin film (indicating). You can see that that is dry already. I will mark that "alcohol ink". (Writing.)

The Court: That means the alcohol is all evaporated?

The Witness: That is correct.

Q. Mr. Bragdon, is it necessary to heat up butyl carbitol until its vapor pressure is exactly equal to that of ethyl alcohol to get this rapid drying of a thin film on a paper? A. No, it does not need to be that high. Any vapor pressure on the order of a few centimeters is sufficient to cause rapid evaporation.

Q. What is the vapor pressure of ethyl alcohol, say at 115 degrees Centigrade? A. The vapor pressure of butyl (45) carbitol do you mean?

Q. Yes, that is what I meant to say, I am sorry. A. At 115 degrees it is about 1½ centimeters.

Q. Have you prepared an ink having a solvent whose vapor pressure is 1½ centimeters at room temperature? A. I have. It is made with secondary butyl acetate, another volatile liquid, as the solvent.

The Court: Is that described in this curve here, the second curve, "butyl carbitol"?

The Witness: No. This is butyl acetate. This is a different chemical compound. Its vapor pressure is not shown in the curve.

The Court: All right.

A. (Continuing) I have selected that merely because its vapor pressure at room temperature is 1½ centimeters, which is the same as butyl carbitol at about 115 degrees Centigrade. I will demonstrate that in the same way.

Q. Here is some more soft paper if you need it to clean up with (handing to witness). A. Thank you. (Demonstrates on paper.)

That is now dry (indicating to Court).

Q. You have drawn this second ink down into a thin film on a piece of paper, Mr. Bragdon? A. I drew that down into a thin film on a piece of paper and that dried immediately.

(46) The Court: How does the thinness of that film there compare with the thinness on the printing press?

The Witness: It is very nearly the same thing.

The Court: The same thickness or thinness, rather?

The Witness: Yes.

Q. Did you find that the film on paper of this ink whose solvent has a vapor pressure of a centimeter and a half at room temperature dried very quickly? A. It does, almost as fast as the film made with ethyl alcohol.

Q. The drying of the film is a matter of seconds, is it not? A. It is.

Q. Or possibly a fraction of a second. I mean it isn't longer than that.

The Court: Is there any objection in the art to having it dry too quickly?

Mr. Byerly: Not after it gets on the paper, your Honor.

The Court: You do not want it to evaporate before it gets on the paper?

Mr. Byerly: Yes. It is very fatal if it evaporates before it gets on the press.

Now I think I will ask the clerk to mark these (47) samples. I will offer in evidence a sample of ink with an alcohol solvent, used by the witness. That will be Plaintiff's Exhibit 6.

(Marked Plaintiff's Exhibit 6.)

Mr. Byerly: I will now offer the film of ink on paper, the ink being that of Plaintiff's Exhibit 6.

(Marked Plaintiff's Exhibit 7.)

Mr. Byerly: I will now offer the second ink sample used by the witness, being the ink whose solvent is butyl acetate, having a vapor pressure of 1½ centimeters at room temperature.

(Marked Plaintiff's Exhibit 8.)

Mr. Byerly: And I offer the film made with that ink. I ask to have that marked as Plaintiff's Exhibit 9.

(Marked Plaintiff's Exhibit 9.)

Q. These inks which you have used, for exhibit purposes, could these be used in ordinary printing? A. They could not. They evaporate so fast that they would gum up the press, as it is called.

Q. Have you a sample of an ink made with the solvent referred to in the patent? That is, butyl carbitol. A. We have an ink here which is made with butyl carbitol. It is similar to the ink described in the patent except that it is made with a black pigment instead of yellow.

(48) Q. Now you have said that the vapor pressure of that solvent at room temperature is very low, on the order of one hundredth of a millimeter? A. That is correct.

Q. Will you spread a little of that ink on paper the same way that you did with the other inks and see what happens.

The Court: What do you call this?

The Witness: This is a butyl carbitol ink.

Mr. Byerly: This is the ink of the patent, your Honor.

(Witness demonstrates.)

A. You will find that this ink will not dry for some time. I have taken the ink and drawn it down with a scraper and I mark it "butyl carbitol ink". (Writing.)

Q. Has that film of ink dried the way the other inks did? A. It has not. It is still very smeary.

Q. Now if that paper with the ink on it were held up to a temperature somewhat above 100 degrees Centigrade how would the ink behave? A. It would behave in the same way that the ink made with alcohol or butyl acetate behaves. It would dry in a matter of a fraction of a second.

Q. In other words, as I understand it the heating of the paper, which is not easy to demonstrate in court, transforms an ink such as you have just placed on the paper into an ink which behaves like the inks which you (49) spread on the paper in making Plaintiff's Exhibit 7 and 9? A. That is correct.

The Court: What exhibit will that be?

Mr. Byerly: I will now offer the butyl carbitol ink as Plaintiff's Exhibit 10.

(Marked Plaintiff's Exhibit 10).

The Court: Is it dry yet?

The Witness: No, that won't be dry for about 48 hours at least.

The Court: It will have gone in the press long before then?

The Witness: In the press with heat it will dry instantaneously on paper.

Mr. Byerly: I offer that paper in evidence.

(Marked Plaintiff's Exhibit 11).

The Witness: I can demonstrate that that ink is still wet by placing another piece of paper over it.

Q. Will you place a piece of paper over Plaintiff's Exhibit 11 (handing to witness). A. (Demonstrating) This is the smudge that is taken off.

Q. Will you do the same thing with Plaintiff's Exhibits 7 and 9 and see if anything comes off. A. (Demonstrating) This is 9. You see it is clear. (Demonstrating) This is Exhibit 7; no smudge comes off.

The Court: You have to control the temperature (50) of these rollers, don't you? If the rollers should happen to get hot it would evaporate before it got to the paper?

The Witness: It would, possibly slightly, but the temperature of the rollers does not get hot enough to cause any appreciable amount of evaporation.

Q. In connection with the Court's question I call your attention again to this graph, Plaintiff's Exhibit 5 for identification, the butyl carbitol curve there seems to run into

the base line at about 50 degrees Centigrade; is that right? A. About there.

Q. How much Fahrenheit is 50 degrees Centigrade? A. 50 degrees Centigrade is about 120, I think—about 122.

Q. If through some accident the printing press got heated up above 100 degrees Fahrenheit, that is, on a very hot day, even then the vapor pressure of butyl carbitol would not rise much, would it? A. Even then the vapor pressure of butyl carbitol would be so low that there would be very, very slow evaporation.

The Court: Would you say that it is constant irrespective of the temperature?

The Witness: No. There is a slight change as the temperature goes up, but the differences from one temperature to another are so very small that they are very hard to detect.

(51) Q. You are referring now to the low temperatures? A. To the low temperatures.

Q. Below 50 degrees Centigrade? A. Below 50 degrees Centigrade, yes.

Q. Of course when you get to temperatures above 100 degrees C. the rise in vapor pressure is very rapid, is it not? A. Yes, above about the point 100 degrees Centigrade the curve approaches almost a vertical line.

Q. And that is why you have said that the vapor pressure above 100 degrees Centigrade is on the order of centimeters whereas at room temperature you have to measure it in hundredths of a millimeter? A. That is correct.

Q. Let me see, that is an increase of about a thousand to one, isn't it? A. That is an increase of the order of a thousand times.

Mr. Byerly: I will offer in evidence the sheet which the witness placed on top of Exhibit 11.

(Marked Plaintiff's Exhibit 12.)

Mr. Byerly: I simply show that, your Honor, because even one-hundredths of a millimeter of vapor pressure might cause drying before the case was concluded, we will have a record of the fact that it was wet.

Q. As I understand it, Mr. Bragdon, no ink came off on the sheets which you placed over Exhibits 7 and 9? (52) A. No. The paper is still perfectly white.

Q. Mr. Bragdon, I should like to come now to the third feature of butyl carbitol vapor pressure, which you have mentioned, and that I think you said was the fact that the vapor pressure remained constant while the liquid was evaporating; is that correct? A. That is correct.

The Court: What is that again?

Q. The third feature is that the vapor pressure remains constant while the liquid is evaporating. Putting that in another way, I take it you mean when the liquid is evaporating it continues to evaporate at substantially the same rate until it is all gone? A. That is correct. Being a single chemical compound it continues to evaporate at the same rate. It has the same vapor pressure from 100 per cent to zero. If it were a mixture of chemical compounds the vapor pressure would change during the course of the evaporation.

Q. Now I will show you another graph——

Mr. Byerly: First I will have this marked for identification.

(Marked Plaintiff's Exhibit 13 for identification.)

Q. Mr. Bragdon, will you now look at the graph, Plaintiff's Exhibit 13 for identification, and particularly at the line marked "butyl carbitol" and point out what (53) that

indicates (handing to witness). A. That is a vapor pressure, a line representing the vapor pressure measurements taken on a sample of butyl carbitol at various stages during evaporation. The first 10 per cent has been cut off here because that represents the accidental impurities, gases, water and so forth.

By the Court:

Q. In other words, the first 10 per cent—where is that? A. That is to the left of this line, which are present in commercial preparations.

Q. This is all at the same temperature? A. These are all made at 150 degrees Centigrade and they show that butyl carbitol beyond the first 10 per cent, which is evaporated, has an almost constant vapor pressure a little above 6 centimeters.

Q. Where does that appear? A. Over here (indicating).

Q. That is going up in that line? A. This is the per cent of residue.

Q. Residue left? A. Yes. In other words, when you have 100 per cent the vapor pressure would be somewhere up here (indicating).

Q. And when you have no residue left? A. Well, that means 100 per cent of the total sample as you begin your measurement.

Q. The total in volume you mean? A. Yes. It is (54) the entire sample.

Q. Well residue is all that you have left when you get up here (indicating)? A. Yes.

Q. You start here with the butyl solvent and then the residue is left, and as this line goes up the solvent gradually leaves? A. No, it is the other direction. You start with the sample containing 100 per cent of the whole material as supplied by the manufacturer at this point, and then gradually evaporate off, little by little. At this point you have 90 per cent left (indicating).

At this point 80 per cent (indicating). At this point 70 per cent (indicating), and so on until down here you would have none of the sample left then.

Q. Everything would be gone? A. Everything would be gone.

Q. What becomes of the residue? Does it evaporate off? A. The residue continues to have a vapor pressure at the same figure of a little over 6 centimeters clear down as far as it was measured, which is a little over above 30 per cent in this case.

Q. Where would the last of the butyl carbitol be? A. Presumably——

Q. Away down here (indicating)? A. Away over here (indicating). This line would be continued. In other words, when you got down to the last drop of butyl carbitol (55) assuming it was good to the last drop, the vapor pressure would still be the same, 6 centimeters.

Mr. Byerly: I think perhaps the word "residue" is a little confusing there, your Honor.

By Mr. Byerly:

Q. By "residue" you simply intend to indicate the point to which the evaporation has proceeded? A. That is it. That is the amount left of the original sample.

Q. You do not mean that it is something different?

The Court: Well, there are certain elements in it that do not evaporate at all. It is only the butyl carbitol that leaves or evaporates, is that right? It gradually leaves more of the solid or residue?

The Witness: Well, these tests were made on the pure solvent, not on inks.

The Court: I understand.

The Witness: These are tests made merely to determine the vapor pressure characteristics.

The Court: Of butyl carbitol?

The Witness: Of butyl carbitol, yes.

The Court: This was not on ink?
The Witness: No.
The Court: I see.

Q. And consequently the word "residue" on the bottom has no relation to the other ingredients of the ink? A. No.

(56) Q. It means merely a stage in the evaporation of the butyl carbitol in which the measurements were taken? A. Yes.

The Court: And you read this from left to right?
The Witness: That is correct.

Q. Now how does ordinary petroleum, like kerosene, act when it is evaporated? Does it have a constant vapor pressure? A. No, it does not. It is a mixture of a number of chemical compounds, with various proportions of carbon and hydrogen, and the more volatile portions evaporate at the start and leave less volatile portions behind so that the vapor pressure is continually dropping during the course of the evaporation.

Q. Does that mean the rate of evaporation is continually decreasing? A. It does. As the vapor pressure drops the rate of evaporation goes down.

Q. Will you point that out to the Court, calling attention to the line marked "kerosene" on the graph, Plaintiff's Exhibit 13 for identification? A. This line here is drawn to represent the vapor pressure measurements on a sample of kerosene which was tested in the same way as the butyl carbitol. The vapor pressure at 10 per cent would be up here somewhere (indicating). We have neglected the first 10 per cent as possibly representing some unavoidable impurities, but at 90 per cent residue that (57) means when you have taken off the first 10 per cent the vapor pressure is a little above 12 centimeters. At 80 per cent is about 9½, and it keeps on dropping until at 30 per cent is down to about 3 centimeters.

The Court: That is a slower evaporation?

The Witness: That would be a much slower evaporation, yes.

Q. Now I call your attention to a statement in the patent beginning at line 53, column 1, page 2, which says:

"The diethylene glycol monobutyl ether may be replaced by other solvents or solvent-mixtures possessing a similar low rate of evaporation at ordinary temperatures and a marked acceleration of volatility at raised temperatures."

Then the patent proceeds to point out that the vapor pressure characteristics of butyl carbitol indicate the properties which a solvent should have in order to be substitutable.

The Court: Is that another name for this substance?

The Witness: Yes. That is another name for butyl carbitol.

Q. Now in view of what the patent says there, could an ordinary petroleum, such, for example, as kerosene or fuel oil or some of these petroleum products (58) that are commonly known on the market, be substituted for butyl carbitol? A. Not with satisfactory results at all. The first portions of the solvent would usually evaporate much too fast, causing the ink to dry on the rollers of the press, and the tails, as they are called, the last portions to evaporate would evaporate so slowly that the ink would be very hard to dry by heating.

Q. What is the characteristic vapor pressure of butyl carbitol that kerosene and fuel oil do not have? A. The fact that the vapor pressure is nearly constant during evaporation, which means that the rate of evaporation will be constant.

Q. That is not true of ordinary petroleum? A. That is not true of ordinary petroleum.

Q. In fact, your "kerosene" line on Plaintiff's Exhibit 13 for identification shows that, does it not? A. It shows that very strikingly.

Q. Now, is there any other characteristic which brings out that same difference in vapor pressure, that is, is there any other characteristic between kerosene, let us say, and butyl carbitol which is related to this failure to evaporate at a uniform rate? Is there any difference in the boiling ranges? Explain what a boiling range is. A. A boiling range is a characteristic which is related to vapor pressure in a certain way. Any (59) mixture of chemical compounds will usually have quite a wide boiling range, whereas a substance like butyl carbitol, which is almost a pure chemical compound, evaporates at a fixed temperature, nearly fixed temperature. Material like kerosene will start at a low point, say around 175 degrees centigrade, and may run up to as high as over 300 degrees centigrade; whereas butyl carbitol boils off completely in the distillation test within a range of about 10 or 15 degrees. The boiling range becomes a measure, then, of the vapor pressure.

Q. That is, kerosene has a very wide boiling range, as I understand it? A. It does.

Q. And butyl carbitol a very narrow boiling range? A. It has.

Q. And that is related to the vapor pressure of these substances in such a way that at some temperature, say below the boiling temperature, like 150, butyl carbitol has a constant vapor pressure as it evaporates and kerosene has a diminishing vapor pressure? A. That is correct.

Q. Now, if you were asked to find some kind of a petroleum product which could be substituted for butyl carbitol under the specifications of the patent, that is, which had vapor pressure characteristics of butyl carbitol, (60) could you do that? A. Yes, I could.

Q. What sort of petroleum product would you get? A. I would get one which had a very low vapor pressure at room temperature, as low or lower than butyl carbitol, which has a very rapid increase in vapor pressure up to a matter of centimeters at 150 degrees centigrade, and one which has a very narrow boiling range. The narrow boiling range would be necessary to assure a constant rate of evaporation.

Q. As I understand, the petroleum you are talking about is one with a very narrow boiling range and is very different from kerosene that you have mentioned before, for instance? A. Yes. It would be a boiling range in the neighborhood of 15 or 20 degrees centigrade.

Q. And what is the boiling range of kerosene? A. From around 175 up to over 300.

Q. I now direct your attention to the patent again, page 2, line 20 of the first column. You will see the formula of ink given by way of illustration. That ink contains a pigment, does it not? A. It does; chrome yellow.

Q. And it has a vehicle, has it not; that is, something to carry the ink? A. It does. The vehicle consists of——

Q. Excuse me just a minute. I would like to ask (61) whether the vehicle contains any solid? A. Yes; nitrocellulose.

Q. And it also contains some liquid, does it not? A. It contains three liquids: butyl carbitol, which is the solvent; dibutylphthalate and castor oil, which are used as plasticizers.

Q. Just what do you mean by a plasticizer, Mr. Bragdon? A. They are liquids of very low vapor pressure which are used as softeners or materials to make the film more flexible. They remain with the solid material preventing it from cracking or rubbing off too readily.

Q. They do not keep it from hardening but merely keep it from getting too brittle? A. That is the idea.

Q. Now the patent mentions two of those plasticizers. One of them is dibutylphthalate. Will you please look at the graph, Plaintiff's Exhibit 5 for identification, and tell

us what that shows about the vapor pressure of dibutyl phthalate. A. That shows that the vapor pressure of dibutylphthalate is very low even at 150 degrees centigrade, a matter of around a millimeter, which would mean a very slow evaporation rate even at that temperature, and in the very short time that the ink film is exposed to heat there would be practically no evaporation at all.

Q. The vapor pressure of that plasticizer dibutyl- (62) phthalate is not of the order of centimeters when you get up to 150, is it? A. It is not, no.

Q. Have you figured from that example given in the patent what proportion of the liquid component of the ink, that is, of the total liquid in the ink—what proportion of it is butyl carbitol? A. About 73 per cent.

The Court: Of what?

The Witness: Of the ink given in the specification of the patent.

The Court: Is that this (indicating)?

The Witness: Yes.

The Court: 73 per cent of that?

The Witness: That is right.

Q. That is, 73 per cent of the total amount of liquid in the ink consists of butyl carbitol? A. That is correct.

Q. And it is the butyl carbitol only, as I understand it, that has the vapor pressure in the order of centimeters when the ink is heated? A. That is correct.

Q. The other substances do not? A. That is correct.

Q. Now have you examined the samples of ink of the defendant's ink, which were produced by the defendant in answer to the interrogatories? A. I have.

Q. They were very small samples, were they not? A. They were very small, yes. They were so small that (63) it was impossible to do very much with them but you could see that they were of the consistency of an ordinary printing ink.

Mr. Free: I might explain, your Honor, at this time that it was not because of unwillingness to give them more. It was because those are the only samples we had left back in 1941.

Mr. Byerly: We have no criticism of that, your Honor.

The Court: Very well.

Mr. Free: But we will concede that the ink, when in proper shape, has the consistency of ordinary printing ink.

The Court: What interrogatory is that?

Mr. Byerly: An answer to Interrogatory 9 I think refers to the giving of the samples—or possibly Interrogatory 8. The answer is quite long. It first refers to giving a sample of the solvent and the inks and then gives some data as to their formulas on the next page.

The Court: Pigment is coloring matter?

The Witness: That is correct.

The Court: And what is resin?

The Witness: Resin is the binder, the solid binding material.

(64) Q. In view of Mr. Free's concession that these inks were of the proper consistency, ordinary consistency of a printing ink, from your examination of them can you say that the solids and liquids in them are of such proportions as to give the right consistency? A. I would say that they are.

Q. Did each ink consist of a pigment dispersed in a vehicle? A. They did. It was evidently so.

Q. Was the vehicle a viscous organic compound? A. It was evident from the samples and from the defendant's reply to the interrogatory that that was the case.

Mr. Free: Your Honor, I object to this line of questioning. Counsel is phrasing his questions in the language of the claim. It is all right to read

them on the patent but not the claim. That is the Judge's job to determine whether or not the claim fits the subject matter accused to infringe.

The Court: Objection sustained.

Mr. Byerly: I am a little puzzled, your Honor, because the patent and the claims describe the same ink, and I presume we have a right to bring it out.

The Court: It is a question of how you framed your question, not what you attempted to bring out, that the objection goes to.

Q. Did each of the defendant's inks contain a (65) solvent? A. According to the defendant's reply to the interrogatories they did. They supplied the formulas for the inks and the formula showed that in the two red inks that they supplied—I mean in the two blue inks that they supplied—the solvent consisted about 84 per cent of the total of the liquid ingredients.

The Court: Where is that?

The Witness: Here (indicating). The liquid ingredients consist of the solvent and this liquid here. This is about 84 per cent of the sum of those. The same with the Cudahy blue. The percentage of the total liquid ingredients—

The Court: Not of the total ink?

The Witness: Not of the total ink. In the two red inks the percentage is about 79 per cent.

In the yellow ink it is about 65 per cent.

In the black ink it is about 86 per cent.

Q. According to defendant's analysis and your examination of these inks, does each ink contain a binder? A. It does. The resin serves as a binder. It is possible that some of the ingredients mentioned as "other ingredients" also serve as binders.

Q. Is there resin in each ink, according to the defendant's analysis. A. There is. In the black ink there is, in

addition to the resin, gilsonite, which is (66) a black material having very much the appearance of a resin. There is some doubt in common trade terminology as to whether or not it should be called a resin, but it performs function of resin in this formula.

Q. The specific example of the patent refers to nitrocellulose, does it not? A. It does.

Q. How does the action of nitrocellulose and a resin compare in such inks? A. They behave in very much the same way. They act as binders. A resin may show a little more tendency to soften under heat than the nitrocellulose but that is not material to the behavior of the ink because usually the ink is cooled artificially immediately after the solvent is driven off by heat.

Q. Then in the case of both nitrocellulose and resin as the solid material, the ink is dry when the solvent is gone? A. That is correct.

Q. Defendant has stated that the solvent in all their inks is the same and it consists of ink oil 502C, is that right? A. That is correct.

Q. Did you examine the sample of this solvent which was furnished by the defendant? A. I did. I found that it had a very narrow boiling range and we determined the vapor pressure characteristics of it in our laboratories. The curve on Plaintiff's Exhibit 5 for identification marked "S and C 502C" shows the vapor pressure at (67) various temperatures of the defendant's solvent.

The Court: What exhibit is that?

The Witness: 5. That shows that the vapor pressure of S and C 502C at 20 degrees Centigrade is of the same order as butyl carbitol. The scale of the graph is not large enough to definitely show where it lies, and at 150 degrees Centigrade the vapor pressure is on the order of centimeters, or over a thousand times.

The Court: Is that 2 Centigrades?

The Witness: 2 centimeters.

Q. Now if this is so, how would the action of this defendant's ink or defendant's solvent 502C—supposing you heated the paper up to 150 degrees Centigrade after it was printed, how would the action of the ink compare with that of the inks which you demonstrated, that is, Exhibits 7 and 9? A. It would evaporate at just about the same rate, at 150 degrees Centigrade, as Exhibit 9.

Q. Exhibit 9 is the ink on the paper and that was the ink which we have marked Plaintiff's Exhibit 8. Now the vapor pressure of that ink I think you said was what? A. Of the solvent is 1½ centimeters, and this being 2 centimeters it would evaporate at about the same rate as that, a little faster than that.

Q. You say this graph, Plaintiff's Exhibit 5 for identi-
(68) fication, does not definitely show how low the vapor pressures are at room temperature. Have any measurements been made in your laboratories, or calculations made to determine whether or not the vapor pressure of 502C is as low as that of butyl carbitol at 20 degrees Centigrade? A. We have made such measurements in our laboratories.

Q. And what was the result? A. We find that the vapor pressure of 502C at 20 degrees Centigrade is as low or lower than butyl carbitol.

The Court: Are all these supposed to come together here (indicating)?

The Witness: Well, the scale of the graph is such that the lines appear to lie on top of each other. There is actually a slight difference between them.

Q. Defendant's interrogatories refer to their various inks as containing "other ingredients" which they do not specify. You found that to be so, did you not? A. I did.

Q. And they do state that some of these ingredients are liquid, do they not? A. They do.

Q. And then I think in the last paragraph of the answer to Interrogatory 9 there is some clue given as to the nature

of those liquids, is there not? A. I will refer to a copy of the interrogatories. (Examining.) They (69) state that "'the other ingredients' referred to above consist of linseed varnish and or perilla varnish, wax and/or grease, drier, and so forth."

The liquid ingredients would be the linseed and/or perilla varnish.

Q. And the formulas show that the amount of this is very much less than the amount of the solvent, do they not? A. Yes.

Q. What is the vapor pressure of these two varnishes mentioned at room temperature? A. It is almost zero. There is practically no evaporation at all from linseed or perilla varnish.

Q. Then in view of what you have said about the vapor pressure of solvent 502C at room temperature, would it be correct to say that the entire liquid part of these inks has a vapor pressure below that of butyl carbitol at room temperature? A. It would be.

Q. Now does this solvent 502C have the other characteristic of the vapor pressure of butyl carbitol to which you have referred? How does its vapor pressure behave while the solvent is evaporating? A. It remains nearly constant because it is a very narrow cut and consists of compounds very nearly identical.

Q. Can you point that out on Plaintiff's Exhibit 13 for identification? A. On this graph here, this lower (70) line represents the vapor pressure of defendant's solvent when various amounts had been evaporated. At 100 per cent it would be over here (indicating); at 90 per cent it is around 2 centimeters. It remains above 1 centimeter clear down to below 30 per cent residue.

Q. I understand the line stops at 30 because actual measurements in the laboratory were not made beyond that, is that correct? A. That is correct.

Q. But if on the basis of what is there, does it look to you as if this solvent would maintain a uniform rate of

evaporation until it is all gone? A. Very nearly uniform clear up to the end.

Q. And referring again to Plaintiff's Exhibit 13 in that respect it appears from that exhibit that it is like butyl carbitol and entirely different from petroleum, such as kerosene, is it not? A. That is correct.

Q. Did you ascertain the chemical composition of solvent 502C? A. In a general way we found that it is a petroleum hydrocarbon, consisting almost entirely of straight chain compounds, and in that respect it has some strong similarities to butyl carbitol, which is also a straight chain compound. It is almost a completely saturated hydrocarbon which gives it a similarity to butyl carbitol. It differs from the aromatic compounds which are ring structures and which usually introduce (71) high reactivity and strong odor.

Q. Referring again to these graphs, Exhibits 5 and 13, which have been marked for identification, are those graphs based on measurements made in your laboratories? A. They are.

Q. Take the graph, Exhibit 5. Did you check the measurements which you had made on butyl carbitol and on the defendant's solvents with the measurements which the defendant made in the presence of counsel? A. We did compare them and found that our measurements checked very closely with those made by the defendant.

Q. I notice on Plaintiff's Exhibit 5 for identification the two forms of dots, one marked "Taylor Exhibit W" and one marked "Taylor Exhibit U". A. Those are the data shown in the defendant's tests on these same materials.

The Court: You took their test and put it on here?

The Witness: We drew the lines from data that we obtained. The actual points are not shown, but the points that are shown are the defendant's data.

Q. They fall very close to your lines, do they not? A. They fall very close to our lines.

The Court: Is this a good place to adjourn?

Mr. Byerly: Yes, but I should first like to offer these two in evidence before we adjourn.

(72) The Court: All right.

Mr. Byerly: I will now offer the graphs previously marked for identification as Exhibits 5 and 13.

The Court: Any objection?

Mr. Free: No objection, your Honor.

The Court: Admitted in evidence.

(Plaintiff's Exhibits 5 and 13 for identification received in evidence.)

The Court: The court will adjourn until two o'clock.

(Recess until 2:00 P. M.)

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(73) AFTERNOON SESSION.

CHARLES R. BRAGDON, resumed the stand.

Direct examination continued by Mr. Byerly:

Q. Are the resins and solid matter contained in the defendant's inks soluble in the solvent 502C, which is used in this ink? A. I assume that they are, because if they were not, you would not get a suitably smooth printing ink.

Q. And on the basis of Mr. Free's admission that the inks have the proper consistency, does that indicate to you that the resins are dissolved in the solvent? A. It does show it; otherwise the inks would give a very rough and unsuitable film.

Q. Can you tell by the samples of the defendant's inks which you have examined, whether the solution of the

resins used by the defendants in the solvent which they use, is a stable solution? A. I would say that it must be, because these samples purport to have been standing for a number of months and they show no evidence of any instability.

Q. Is the solution made by dissolving these resins in this solvent viscous? A. It would be naturally quite viscous.

The Court: You mean sticky?

The Witness: Thick, like molasses.

(74) Mr. Byerly: That is all. You can cross-examine.

Cross examination by Mr. Free:

Q. Mr. Bragdon, is it fair to say that this ink we are talking about is like the old linseed varnish inks in every respect except that the linseed varnish has substituted for it a resin dissolved in this high boiling solvent? A. Well, I think that would be fair.

The Court: What are you talking about, the plaintiff's or defendant's ink, or this whole class?

Mr. Free: This whole class, your Honor.

Q. The pigments are the same as they always have been? A. The same as they always have been.

Q. The print from the same type? They print from the same type as they always did? A. That is correct.

Q. On the same presses? A. The same presses, plus heating equipment.

Q. The same paper? A. The same paper can be used.

Q. When you substitute the resin dissolved in the solvent for the old linseed varnish, you make it about as thick as the old varnish, don't you? A. You do.

Q. So then we have this as a description of the new ink, that the only change is the substitution of a resin dissolved in a high boiling solvent for the old linseed varnish, is that right? A. Resin dissolved in a solvent (75) of the vapor pressure characteristics of butyl carbitol.

Q. As I understand it, in reference to Plaintiff's Exhibit 5, the defendant's solvent 502C oil there shown has a vapor pressure at 150° of about 20 millimeters, according to the curve, is that what you make it? A. The defendant's solvent is approximately 20 millimeters, or 2 centimeters.

Q. And that, as I understand it, is a high boiling petroleum fraction. We are all agreed on that, aren't we? A. We are.

The Court: Petroleum what?

Mr. Free: Petroleum fraction.

Q. In reference to Plaintiff's Exhibit 13, you cut off 10 per cent of the 502C oil before you measured it, did you not? A. Yes.

Q. You understand that that part you measured was ten per cent less than what was given to you and is not what we use in our ink, do you not? A. Well, it corresponds in the same manner to the butyl carbitol.

Q. That is, what you measured on this curve, Plaintiff's Exhibit 13, was 90 per cent of our solvent and not 100 per cent? A. That is correct.

Q. If you had measured 100 per cent as it was given to you, the curve would have been a little steeper at the beginning, would it not? A. A little.

(76) Q. And the boiling range, therefore, would not be as narrow as you have shown it on Plaintiff's Exhibit 13, is that right? A. Not quite as narrow.

Q. That is also true of butyl carbitol as shown on Plaintiff's Exhibit 13, is it not? A. That is true.

Q. What is the boiling range of butyl carbitol as it comes from the manufacturer? A. It is about between 10 and 15 degrees centigrade.

Q. In your previous testimony given in 1938, which you will remember, you were asked this question:

"What is the boiling range of butyl carbitol? A. The extreme boiling range is about 28 degrees."

Is that in accordance with your recollection? A. I think it is about correct, yes.

Q. That is commercial butyl carbitol? A. That is commercial butyl carbitol.

Q. And that is what you use in your inks, a commercial butyl carbitol? A. That is correct.

Q. A commercial butyl carbitol is what Brewer and Gardner predicated their vapor pressure points on too, did they not? A. I believe it was commercial butyl carbitol.

Q. Did you tell us what the boiling range of defendant's 502C oil is? A. I think I have it here. I do not have the boiling range in mind.

The Court: What is the boiling range of butyl (77) carbitol?

The Witness: It is from about 215 to about 233 Centigrade.

Q. Have you had occasion to examine defendant's 502C oil fairly closely? A. Fairly closely, yes.

Q. You know what it is, do you not? A. Yes, I know that it is a petroleum distillate.

Q. Do you know what source it comes from? A. It comes from the parafinnic type of petroleum.

Q. Commonly known as the kerosene series? A. It could be considered roughly in the kerosene family.

Q. That is, the upper range of the kerosene family? A. Yes, I would say it is about in that range.

Q. We have heard a lot about boiling ranges this morning. Is there anything, any reference in the patent at all, to boiling range? A. I do not recall any. I do not find any.

Q. Do you happen to know what the vapor pressure of ordinary water is at room temperature, say 20 degrees Centigrade? A. It is about 1½ centimeters.

Q. About 15 millimeters? A. That is correct.

Q. The vapor pressure of alcohol, according to this patent, is about 40 millimeters at 20 degrees Centigrade? A. That is correct.

Q. Would you call water and alcohol similar or dis-
(78) similar insofar as vapor pressures are concerned? A. I would say they are in about the same class. They would evaporate at about the same rate when exposed in an open vessel.

Q. Yet the vapor pressure of alcohol is more than twice as much as that of water at 20 degrees centigrade, is it not? A. That is right.

Q. You say the evaporation rate is about the same, nevertheless? A. About the same, yes.

Q. Alcohol evaporates faster than water at room temperature, does it not? A. It does.

Q. And that is because of the difference between their vapor pressures at room temperature? A. That is true.

Q. Is this a fair statement, that vapor pressure and boiling point are related to each other? A. They are.

Q. The higher the vapor pressure of a given substance the lower its boiling point? A. As a general rule.

Q. And the converse is true also? A. Yes, as a general rule.

Q. Will you take a look at your patent, please, particularly on page 2, column 1, line 49, where butyl carbitol is described as a chemical compound of carbon, hydrogen and oxygen, and tell me whether that description fits a high boiling petroleum solvent like 502C oil? A. It does not fit, in that petroleum hydrocarbon is merely carbon
(79) and hydrogen. In other respects it would fit fairly well, except that 502C is a mixture of compounds rather than a single compound.

Q. Just what do you mean by a mixture of compounds, what compounds? A. Well, it is a mixture perhaps of a hydrocarbon with say, 12 carbon atoms and 26 hydrogen atoms, and one with 13 carbon atoms and 28 hydrogen

atoms, and so on. There may be several of that series present in the 502C.

Q. I have a note here that according to the boiling range of defendant's 502C oil, it contains apparently some tetradecane and some hexadecane and some pentadecane, those being the carbo-hydrogen compounds you had in mind, isn't that right? A. That is correct.

Q. One boils at 252 centigrade, another at 270 centigrade, and another at 287, is that in accordance with your understanding of those compounds? A. It is substantially the way they would run.

Q. Referring again to the patent in suit, I have read it over pretty carefully and the only solvent that I find mentioned there having the vapor pressure characteristics described, is this diethylene glycol monobutyl ether, did you find that to be the case also? A. The patent says that any solvent may be used which has a vapor pressure as low as that of butyl carbitol at 20 degrees centigrade, (80) and approximately as high as that of alcohol at 150 degrees centigrade.

Q. And that is about 40 millimeters at 150 degrees centigrade? A. In that general range, yes.

Q. But the only substance you find mentioned in the patent that conforms to those requirements is butyl carbitol, is it not? A. That is so.

Q. There is no mention of high boiling petroleum fractions or anything like that, is there? A. I do not find any.

Q. Down at the bottom of page 1 of the patent, second column, line 53, it is stated:

> "Among this peculiar class of solvents I have found as an example" this butyl carbitol.

What is peculiar about that class? A. That is the class having the vapor pressure characteristics which I described this morning, that is, having a very low vapor pressure at room temperature, a vapor pressure which increases very

rapidly at temperatures about 100 degrees centigrade, and which have a nearly constant vapor pressure during evaporation.

Q. Do you know any solvent which might be used here which is different from that, having the boiling point around the boiling point of butyl carbitol? A. There are a great many organic compounds which would lie fairly (81) close to that description.

Q. Just as peculiar in that sense as butyl carbitol? A. They would fall outside the class, usually in either being higher than butyl carbitol at 20 degrees centigrade or in being too low at the other end.

Q. That is, you would not find one that would fit exactly? A. Not very many. You would find a few that would be in that general class, that would fit that description.

Q. But those that fit exactly would be the same in the sense of this peculiar action? A. Yes.

Q. How close would you have to come to this curve of butyl carbitol to retain this peculiarity you have referred to?

Mr. Byerly: I object to that.

A. A reasonable distance, I would say. For instance, the solvents which would lie, as illustrated by the experiments I ran this morning, perhaps from about 1½ centimeters to 6 centimeters at 150, and a few hundredths of a millimeter at 20.

Q. So anything which would do the job between 1½ centimeters to 60 at 150 degrees centigrade, would be in that class in your opinion? A. Around 1½ to 6 centimeters.

Q. I show you a set of curves which have drawn on them (82) a curve B, marked "butyl carbitol," and ask you to pick out solvents on that set of curves coming within the specifications you have just mentioned? A. There are none here that lie very close to that curve.

Q. Do you find one there which lies between 1½ and 6 at 150 degrees centigrade? Those two? A. There is 150 degrees here. Those are much lower than butyl carbitol, at 150 degrees centigrade.

Q. Are they lower than 1½ centimeters at 150 degrees? A. I cannot see by this chart. I think they would be lower.

Q. 1½ centimeters would be pretty close to that base line? A. It would be.

Q. And those two curves which are marked "ethyl ether of triethylene glycol" and "diethylene glycol", are above that base curve, are they not? A. Above the base line.

Q. At least 1½ centimeters above it? A. I don't think they would be. They would be pretty close to the 1½ centimeters.

Q. I show you another set of curves which are straight lines instead of curves, and therefore more readable, and ask you to pick out of that chart any solvents you find which come within the description you mentioned, that is, solvents having a vapor pressure at 150° C. between 1½ and 6 centimeters.

(83) Mr. Byerly: I object to that question because in the class mentioned by the witness he gave a limit to the vapor pressure both at the start, and also specified what the vapor pressure must be at 20. I think it is an unfair statement of the class of solvents to which he referred to refer to the limit only at one end. I have no objection to his answering a question as to that limit, but that is not the class to which he refers.

The Court: You can bring that out on redirect, if you wish. It is not very clear.

A. According to this chart the vapor pressures of diethylene glycol and of the ethyl ether of triethylene glycol both lie slightly above 1½ centimeters at 150 degrees centigrade.

Q. Will you tell me whether those solvents satisfy the

requirements that you mentioned at 20 degrees centigrade? A. They would be as low or lower than butyl carbitol.

Mr. Free: I offer in evidence the set of curves just referred to by the witness.

Mr. Byerly: I object to the exhibit as entirely unproved.

The Court: I think that objection is good, Mr. Free.

Mr. Free: I will ask to have it marked for (84) identification.

(Marked Defendant's Exhibit A for identification.)

Q. Still referring to this peculiar class of solvents we have been talking about, it is a fact, isn't it, that any of these solvents you mentioned will evaporate if heated high enough? A. They will. In some cases you have to heat them very high.

Q. Did you have occasion to notice the odor of defendant's 502C oil? A. I did.

Q. It has quite an odor? A. I would say a very mild odor.

Q. Sort of a kerosene smell? A. Slightly resembling kerosene.

Q. You would not call it odorless? A. No, not entirely.

Q. Or colorless? A. No.

Q. It has a straw color, hasn't it? A. A very light straw color.

Q. In that respect the presence of the odor in the 502C oil makes it differ from butyl carbitol as described in the first column of page 2 of the patent, does it not? A. Reading from line 49, page 2, column 1:

"Diethylene glycol monobutyl ether is a practically odorless, saturated," etc.

It has a slight odor also.

Mr. Free: That is all.

(85) *Re-direct examination by Mr. Byerly:*

Q. You have referred to the fact that the curves on Exhibit 13 are started after ten per cent of the material is evaporated, and I think you said that was to get rid of volatile impurities that the substances might contain? A. They may contain dissolved gases, some water, and, for instance, butyl carbitol may contain traces of butyl alcohol.

The Court: Do those go off first?

The Witness: They go off first.

The Court: Waiting until ten per cent has gone off, you get a better product to start with?

The Witness: That is correct.

Q. In your Exhibit 5 in which you gave vapor pressure curves at different temperatures in getting those points did you proceed in the same way as making Exhibit 13, that is, did you let ten per cent go off before the measurements in order to get correct results? A. We did.

Q. And these results you have already said that you obtained, checked with the measurements made by the defendant? A. They did.

Q. From which I assume it is customary to remove a little to get rid of the volatile impurities before making vapor pressures? A. That is correct. By the method used by the defendant for measuring vapor pressures you would (86) always lose a small amount of the solvent before you would get your reading.

Mr. Byerly: That is all.

Re-cross examination by Mr. Free:

Q. Just to make it clear, you do not take off the first ten per cent of butyl carbitol before you put it in the ink, do you? A. No, we do not.

Q. As far as you know, the defendant does not do that to his 5020 oil either? A. No.

Q. You use it as it comes from the manufacturer? A. We do.

Q. Which is reasonably pure? A. Commercially pure.

Q. Pure enough for an ink? A. Pure enough for an ink, yes.

Q. As a matter of fact, an ink contains lots of impurities in addition to that? A. It probably does contain some other impurities, yes.

Q. Resins contain impurities? A. They do.

Q. Pigments contain impurities? A. Yes.

Q. Plasticizers do? A. Yes.

Q. Everything does? A. Most things do.

Re-direct examination by Mr. Byerly:

Q. Did you notice whether the presence of these small amounts of impurities in butyl carbitol or any other ink solvents, have an effect on the ink on the rollers of (87) the press? A. Very little effect. Those volatile impurities probably do come off largely during the time that the ink is making its way from the fountain to the type.

Q. Is there enough of them to make any change in the consistency of the ink? A. There is not enough of them to make any appreciable difference in consistency.

The Court: Are these inks all used with the series of rollers that you described this morning?

The Witness: They are in practically all regular printing installations.

The Court: Is that 18 different rollers it passes over?

The Witness: Yes.

Frank W. Cray, for Plaintiff—Direct.

FRANK W. CRAY, called as a witness on behalf of the plaintiff, being first duly sworn, testified as follows:

Direct examination by Mr. Byerly:

Q. What is your occupation? A. Vice-president of Eastern Division, International Printing Ink Corporation.

(Answer read.)

The Witness: I will change that. I am Divisional Vice-President of the International Printing Ink Division of Interchemical Corporation.

(88) Q. At any rate, you are employed by the plaintiff? A. That is right.

Q. How long have you been in the employ of the plaintiff, Mr. Cray? A. Since the early part of 1935.

Q. How long have you been in the printing ink business? A. Since 1905.

Q. Did you have your own printing company for part of that period? A. From 1917 or 1918 to 1935.

Q. What was the name of your company? A. Cray-Finne Corporation.

Q. In the course of your forty years' experience in ink making have you learned how to compound inks, the art as we might say, of mixing things together to make inks? A. I imagine so, yes.

Q. Have you learned how to adjust the consistency or body or weight of an ink to the particular printing press and particular type of paper with which it is to be used? A. Yes, I think that has been the custom since almost the beginning of time, and particularly more so now with the coming of high speed presses.

Q. How do you do that, Mr. Cray, how do you get the ink the right consistency for a particular job? A. By using the right body or varnish, I should say.

Q. You use a number of different varnishes, as you call them, do you? A. Yes, eight or ten, twelve or (89) fifteen—probably fifteen different bodies.

Q. At the time you had your own company, those varnishes were different sorts of linseed oil? A. Mostly linseed, with very little china wood oil, and what we call a mineral oil varnish, which was a resin, plus an ordinary mineral.

Q. And those varnishes all had different bodies, as you call them? A. Yes.

Q. That means they were different thicknesses? A. Different consistencies or thicknesses.

Q. When you wanted an ink of a particular consistency for a particular job, what did you do, mix certain of those together? A. Sometimes you would make an ink out of two and other times you might use five or six of the different varnishes to compound an ink.

Q. And that adjusting of inks to the particular sort of press and paper, has that gone on ever since you have been in the printing business forty years? A. It certainly has.

Q. And they are doing it now? A. I will say they do.

The Court: For different jobs you use different inks.

The Witness: Yes, and for different types of equipment, for different types of presses. You use different inks.

(90) The Court: The Illustrated Weekly is printed with one type of ink and a newspaper is printed with another, and commercial printing is another type of ink?

The Witness: Yes, it might be quite different, depending on the speed of the press and the type of paper. The type of paper is usually the most important factor that determines the type of ink you are going to use on it, and then the question of the speed of the press is a very important factor, too. For instance, if you are running on a highly coated paper that has a delicate surface, you cannot have

much tack or pull in that ink or it will pick the paper as it goes through the press.

Q. Does the speed of the ink rollers of the press make a difference in the body of the ink you ought to use? A. Yes, I would say that was another factor that enters in. For instance, on these new type high speed job presses with small rollers, those rollers make a great many more revolutions in a given period than the larger sized rollers do. Consequently, unless you have your pigment and vehicle perfectly bound together, sometimes these fast running job presses will throw that ink off and throw it all over the room, not only put it on the paper but throw it all over the place.

Q. So that you do have to consider the kind of press to get the consistency, body and everything right? (91) A. I think you do. That is a factor.

Q. Since you have been with the plaintiff have you taken part in the selling of the plaintiff's heat set inks? A. I certainly have.

Q. What name are those inks sold under? A. Vaporin.

Q. Have you been in some of the printing establishments where these inks have been used? A. Yes, most of them.

The Court: Is the name Vaporin a trade name?

The Witness: Yes, V-a-p-o-r-i-n.

Mr. Byerly: Can your Honor see that diagram?

The Court: Yes.

Q. I have just placed an enlarged diagram of a printing press before you. Are you familiar with this type of press? A. Yes, I am.

Q. Have you seen this press used with the plaintiff's "Vaporin" inks? A. Yes, I have seen a number of them used in different places, of that type.

Q. Will you explain how that press works, particularly how the paper and how the ink goes through the press, so that the Court can understand the operation of this ma-

chine? A. I guess I can describe it. This would be what is known as a two-web, two-color perfecting press. You can run two separate webs through this machine at the same time, and you can put either one or two colors on both sides of each (92) web. This represents the paper roll and here is your first printing unit. This is the impression cylinder, and these are what we call the color cylinders, or the printing cylinders. These two cylinders are the—

The Court: What do you mean by web?

The Witness: The paper. After it is printed here, for instance, it moves on through this heating unit. This is a gas heating unit, which probably gets a temperature up to 1500 degrees Fahrenheit. This web, understand, is traveling at a speed of anywheres from 750 to 1000 linear feet per minute. After it goes through the heating unit it immediately passes over these two 10-inch cooling rollers. Then the web is reversed and comes down through these angle rollers and is printed on the opposite side. Here in this instance is the impression cylinder and here are the printing cylinders. She then passes through the second heating unit and over the second set of cooling rollers and then up in and in case this upper deck is running it joins that web and goes down into the folders and creasers. This apparatus here sheets it and folds it into 16-page signatures. The best way to describe that is a 16-page book and all cut and folded. There would be on this press four of those 16-page books running at one time, or, in other words, this is what is known as a 96-page perfecting press.

(93) Q. Will you show how the ink goes on these things that you have called the printing cylinders? The printing cylinder, as I understand it, is the thing that carries the type on it, or the raised plates from which the printing is done? A. Yes.

Q. Will you point out how the ink gets into the printing cylinders? A. This side elevation does not show that too good. However, this represents the fountain, I presume.

Q. How about the diagram here? A. Here is your fountain. Here is your fountain roller, and here is your ductor rollers. Then it comes over here to a set of angles or distributors.

The Court: You have got the ink on the very last.

The Witness: Yes, there is the ink, and this causes that, and then this helps break it down, that is, break it up. Then this comes over and you have a motion here like that (illustrating). That feeds these rollers. These are what you call distributors, or the rollers that are used to break up the ink into a fine film. Then it is passed on to these rollers here, known as your form rollers, which come into direct contact with the printing cylinders. That is what prints. That is what has the type.

(94) Q. These rollers, which are marked R, oscillate, that is, move so as to pick up a little ink on one side and move it over to the roller on the other side? A. They oscillate and move back and forth their ink supply, pick their ink supply up from the fountain roller.

Q. Do any of these rollers have an end-wise movement as they turn around? A. Yes, they move both ways. That is to help break down the film.

Q. In the uppermost picture on the diagram these ink fountain and ink rollers are shown, are they not, in connection— A. That is right. That is the roller unit, the distributing unit for each cylinder. Each cylinder has its own distributing unit.

Q. That is because it prints in a different color? A. Yes, this probably would be one color and that another one.

Q. Have you seen the plaintiff's "Vaporin" ink in use on this sort of a press? A. Sure, many times.

Q. How does the ink behave in traveling from the fountain through all these rollers to the plate cylinder? A. It has to remain stable or you would be in printing troubles.

Q. Well, does it remain stable? A. It does remain stable, surely.

Q. Then what happens to the ink after it gets on the (95) paper and the paper goes through these heaters? A. It immediately is vaporized. These heaters are only about four feet and a half long, so you can figure out how short a space of time it is all through when that web is traveling 750 feet a minute. It is closed partially. There is just about that much space in there for this web to travel. That is about two inches, I would say, wide. The heating units themselves come down within an inch of the paper, or an inch and a half, and as that press is stopped those heaters turn away. In some instances they have radiant type caps on. Some have a ribbon type burner on. In the case of a ribbon type burner the length of that flame is synchronized to the speed of the press. This type is radiant heat entirely. They are 2-inch caps, but the most modern equipment now is this ribbon type burner, and that is controlled. If the press is running, we will say, 700 feet a minute, that would probably be four inches long, but as the press slows down, the flame shortens up, and consequently we save much more paper than we do in presses of this type. We lost quite a lot of paper that way in that interval it takes to turn the burners on and off, when the press is running at 700 feet, even though this turning off operation may only take ten seconds. You have got a lot of paper through there in that time.

(96) Q. If I understand you correctly, when the press is actually running each piece of paper along this web stays in the heater for a very short time? A. For a very short time.

Q. A matter of seconds. A. A very small fraction of a second. I would say that you get anywhere from 250 to 275 degrees Fahrenheit on the web itself, but that is im-

mediately dropped down again by these two coolers which they pass over. That ink when it comes out of there it is hot and the paper is hot, but immediately goes over the coolers and the paper goes back to room temperature again.

Q. When the web gets to this point here on the heaters and cooling rollers, if you put your finger on it, would that ink rub on there? A. That is dry.

Q. So it is entirely dry by the time you print on the other side of the paper? A. Absolutely.

Q. And as the ink is placed on the second side of the paper, then it becomes perfectly dry when the paper passes through the second heater here? A. In order to go through this folding mechanism.

Q. That is, the folding mechanism would cause smearing and blotting if the ink were not dry on both sides of the paper? A. That is right.

Mr. Byerly: I offer this chart in evidence.

(97) (Marked Plaintiff's Exhibit 14.)

Q. Mr. Cray, when did you first see a press running with an ink that stayed soft and stable on the ink rollers and then dried immediately when the paper was heated after it had been printed? A. In May 1932.

Q. Where did you see a press running with such an ink? A. Paterson Parchment Paper Company.

Q. Where is the plant, or where was the plant of the Paterson Parchment Paper Company? A. It was at that time located in Passaic, New Jersey.

The Court: What was it he first saw?

Mr. Byerly: He first saw an ink which stayed soft on the rollers of the press and dried instantly by heat.

Q. What was the business of the Paterson Parchment Paper Company? A. Well, they made this special parchment paper which is used mainly for wrapping foodstuffs,

like butter was their chief thing. Ham, cheese, sausages and things of that kind, used almost exclusively for wrapping foodstuffs.

Q. Did they print this parchment paper after they made it; did they print labels and things on it? A. They did.

Q. Were they customers of your ink company, the Cray-Finne Company? A. They were for many years.

(98) Q. It was in 1932 you saw this, you say? A. Yes.

Q. About that time did your company do any business with a company called Zinsser & Company? A. That is right, we did.

Q. What was their business? A. They manufactured dry colors mainly; at least that is what we bought from them.

Q. Were you acquainted with their chief chemist? A. Yes.

Q. What was his name? A. Dr. Gessler.

Q. I want you to tell us how you came to see this ink in 1932 running on a press, that stayed soft on the press and dried instantly by heat. In the first place, was that an ink which you yourself had brought over to the Paterson Parchment Paper Company, I mean they got the ink from you? A. That is right. Well, there was quite a little of it before 1932.

Q. Just tell us how you happened to get hold of an ink like that? A. We were looking for an odorless ink and had been for years, and we finally tried everything in the vegetable oil field, and got into the lacquer field, and we did not make any too much progress. In 1930 I met a salesman from the Zinsser Company, who called on us as a general thing, and he told me about a new development of dispersing color in blown castor oil and dibutyl ethyl (99) that Dr. Gessler was working on, and it occurred to me that that might be a lead for these odorless inks. I arranged for a meeting with Dr. Gessler. He came down to New York and we had lunch and discussed the problem. He gave us many samples, probably ten samples, of these dispersed inks. We

did a considerable amount of work from the early part of 1930 up into September or October of that year, and finally gave it up as a pretty hopeless task, because we found that if we got an ink that would dry on the paper it would also dry on the press and if we got an ink that would stay open on the press it would not dry on the paper. So there was a fine balance somewheres, but we could not seem to hit it, and after seven or eight months of trial and error method, we came to the conclusion that we just could not do much with that type of ink. We laid it aside and forgot it for probably the best part of a year.

(100) The Paterson Parchment Paper Company had seen samples of this ink and were very much interested in it because of its absolute lack of odor. We had an odorless ink, which was something we had been looking for for many, many years, and have kept—continued to put pressure on me in spite of the fact that I admitted we were licked. I couldn't get rid of them. They kept right on top of us, and finally, in the end of 1931, about the end of 1931, I got a hold of Dr. Gessler again and said, "We have got to do something about this situation out there."

In the meantime, I had given a lot of thought to why we failed, and I also gave a lot of thought to the type of presses that the Paterson Parchment Paper Company were using, and knowing how they dried lacquers I wondered if there would be any possible chance of doing something along that line. So I got hold of Dr. Gessler, and I discussed that point with him. I said, "Could you make me an ink that would be dry after being printed? We can put it over some kind of a heating device." He said, "Yes, I think we could." He said, "In fact, one of those inks I made for you in the beginning would do that."

Well he did not have his notebook with him, and I said, "Well, I would like to know which one of those samples would do that", and he went back to Hastings, (101) where his company was located, and called me back, I think the next morning, and pointed out one of these inks. At that time

we had very very small samples left, and they had deteriorated to a point where they were pretty hard, and I suggested to him that he make some larger samples.

In February of that year, 1932, he sent me these first samples, and following out some instructions which he gave me, I was able to make a print of that and pass that print over a hot plate and dry the ink. From there on we went to work. We had considerable work, and I had to go out to the Paterson Parchment—well, we had considerable work to do with formulating. Then there was a change to be made—changing the Paterson Parchment Paper Company, selling them the idea that there be a change from those two drums which were filled with brine for cooling purposes, change one of those over and let me put superheated steam in there so that we could try out these experiments. Well, along in May of that year, the first part of May, we finally had an ink that we thought could do this job, and we had reconverted that press over so that we used one of these big 60-inch drums for steam. We put steam in, and after our web was printed we ran it over, and we used the other one for the cooling unit, and one into a rewind, and that (102) is the first time that I ever saw an ink printed and dried instantly. I think that was in the early part of May, 1932.

Q. Now you say it went into a rewind. I take it this press out at the Paterson place was somewhat different from the large press you have considered here in connection with Plaintiff's Exhibit 14? A. Yes. It only printed on one side of the paper. For instance, if it was a three-colored paper it printed all three colors, all on one side of the paper.

Q. And the paper went by just one, or several of these printing units to get the colors? A. Three.

Q. Then it went right around a steam-heated drum, or a drum in which you put steam? A. That is right.

Q. Then was it rolled up again, or rewound? A. It went into a rewind.

Q. That is, rolled up tight on a drum? A. Rolled up tight; yes, sir.

Q. Did you find that this ink was so dry that it did not blot off, come off on the back of the web when it went into this type of rewind? A. Yes; absolutely dry.

Q. Now had the Paterson Company previously used this same press with ordinary linseed oil inks? A. Yes.

Q. Did those inks dry as soon as they were printed? A. No, they did not. They were oxidizing inks.

(103) Q. How could they run them into this rewind without their coming off on the back of the web? A. They did it by using what is known as a wax eliminator; that is, after they printed the three colors, one, two or three colors on, they put a film, a coat of hot paraffin wax right on top of the inks, and then that sheet rolled over these two brine rollers which were cold, of course, and that chilled the wax and kept it from sticking when it went into the rewind.

Q. I see. So that they had to have a layer of wax— A. That is right.

Q. —to keep the ink while it was still wet from sticking to the other side of the paper? A. That is right.

Q. And that is why they had these brine rollers on there to chill the wax? A. Yes.

Q. When you started using this new ink that you brought out you put steam in those instead of cooling? A. Put steam in one of them, in one of the cylinders.

Q. You say that that was the first time you had ever seen ink that stayed soft on the rollers and then was dried instantly on the papers? A. The first time.

Q. Did the people out at the press there, the Paterson Parchment Paper Company, express any particular interest in this ink? A. Well, they were all very (104) enthusiastic, of course. They had an odorless ink, and started out looking for an odorless ink, and then wound up with an odorless ink plus one that would dry instantly.

Q. Did you know a man out there named O. P. Smith? A. Yes, sir.

Q. He was connected with the Paterson Parchment Paper Company? A. Yes, sir; superintendent of printing department.

Q. Did you make any contact with the Curtis Publishing Company, that publishes the Saturday Evening Post, after you had run this ink successfully and dried it, out there at the Paterson plant? A. No, I don't think that is quite straight. O. P. Smith evidently told the Curtis Company what we were doing at his place, and the Curtis Company then contacted me. I think that is the way, as I remember it.

Q. What individuals from the Curtis Company contacted you, do you remember? A. Mr. MacGregor and Mr. Trayser.

Q. Did they come over to see you in New York? A. Well, they asked Mr. Smith if he would arrange for us to show them this new miracle ink, and Mr. Smith asked us if we would make up a black of the type that would commonly be used in magazines, such as the Saturday Evening (105) Post, and I don't remember whether Mr. Smith or they got a roll of paper which would be somewhat comparable to magazine paper. All that we agreed to do, we made a black, and then we made arrangements for—Mr. Smith set a date for the test run——

Q. Let me interrupt you there, Mr. Cray. What color was the ink which you first printed at Paterson, and which dried? A. Yellow, chrome yellow.

Q. Do you recognize this print which I now show you (handing to witness)? A. Yes.

Q. What is that, Mr. Cray? A. That is the first heat-dried ink I ever saw.

Mr. Byerly: I will offer that in evidence as Plaintiff's Exhibit 15.

(Marked Plaintiff's Exhibit 15.)

Q. Did you know a Mr. Dufford out there at the Paterson plant? A. Yes, sir.

Q. What was his position there? A. Chief chemist.

Q. I notice on this print, Plaintiff's Exhibit 15, the words "All 2 sec." Do you know who wrote that, and what it means? A. I imagine——

The Court: Well, don't imagine.

A. No, I don't know what it is.

Mr. Free: If your Honor please, this is all very interesting, but I do not see the materiality or (106) relevancy of it on the plaintiff's prima facie case.

Mr. Byerly: I think some of this might properly go in on rebuttal, but in order to avoid recalling this witness I thought I would let him tell his whole story.

The Court: Very well.

By Mr. Byerly:

Q. Now I show you a memorandum. Can you recognize that (handing to witness)? A. Yes, I do. That is Dr. Dufford's memorandum.

Q. Is that in Dr. Dufford's handwriting? A. It is.

Q. It says "Printing—New Ink Speed 132 feet per minute.

"Drum contact total 3 seconds. 25 pounds pressure, 237° Fahrenheit."

Do you recognize those notes as relating to that first test? A. That was the condition under which the first test was made.

Q. And what is the date of that memorandum? A. May 10, 1932.

Mr. Byerly: I will offer that in evidence.

Mr. Free: I think it is incompetent, your Honor, somebody else's notes, and he does not seem to know anything about them.

The Court: I do not think they have been properly identified yet.

(107) Mr. Byerly: I will mark them for identification, your Honor, and will call the witness who wrote them, if it becomes material.

(Marked Plaintiff's Exhibit 16 for identification.)

Q. Now, Mr. Cray, I interrupted you when you were telling of making up a black ink which would be more like magazine printing ink, for a test for the Curtis Company people. A. Yes.

Q. I think that was just at the point where you said you made this black ink; is that right? A. Yes. We made a black ink up, and Mr. Smith made arrangements for the press trial, and I met Mr. Trayser and Mr. MacGregor in New York and drove them out to Passaic, where we were to run this test for them. It was a black ink run on the same press, on paper that was comparable, or sulphide sheet that was comparable to what they were using in the Saturday Evening Post at the time.

Q. Did the ink stay moist on the rollers when placed to press? A. It did, and dried on the paper.

Q. Dried instantly on the paper? A. Yes.

Q. Did it run in a tight roll, the way you described? A. Yes.

Q. Was there any blotting or offsetting? A. No sign of offsetting whatever.

Q. Did the representatives of the Curtis Company, (108) Mr. MacGregor and Mr. Trayser, show any interest in its development? A. Yes.

Mr. Frees: I do not think he is competent to answer that question.

The Court: I do not think he can tell what their opinion was of it. He may say anything they said.

Mr. Byerly: That is all I want, anything they

said or did, just to get their reactions so far as the witness is concerned.

The Court: Well, if he had any further negotiations with them he may tell about that. What their emotions were or expressions were would hardly be for him to say.

Q. Tell us what they did. A. Well they invited me to come over and go to work in their press room, and I think they probably were over in Passaic along in September, because as I remember it took us about a month to get ready to make these tests in Philadelphia. In addition to that, they had one particular press that they wanted available for these experiments, and we had to wait until they got finished with their run on that; so about a month elapsed before our first experimental run at the Curtis Publishing Company in Philadelphia. That, I think, took place in the early part of November, 1932. We were given a press to work on, which was one of about 75 of their (109) standard machines. This is known as a six-color press. It prints one or two colors on the first side, and four colors on the second side. They had been conducting their ozone operations on this particular press, and had a small steam drum of about 16 inches on it, which they had used in their ozone tests. That is all we had the first day. So it was obvious from the beginning that we could not run full speed with a small drum, but we did run enough in the first couple of tests to indicate that we could dry this ink on that type of equipment, but we could not run full speed without increasing our heating area.

The Court: Did the speed depend upon your ability to heat?

The Witness: Yes. We only had a small 16-inch drum and you had to get a pretty good wrapper on that, and if you wanted to dry at faster speed you would simply have to increase the size of the drum.

Q. But you did succeed in demonstrating that heating the paper would dry the ink? A. Without any doubt.

Q. Do you remember what you printed over there at that first test of Curtis? A. Yes, I do.

Q. (Hands paper to witness.) A. That is the job. That is part of the sheet, a page out of the sheet.

Q. Is there any date on that sheet to show that it (110) was made? A. Yes. This says November 12, 1932. Mr. Finne wrote that.

Mr. Byerly: I will offer in evidence the sheet of Mr. Finne.

(Marked Plaintiff's Exhibit 17.)

Q. After these first tests, was any more of this ink run over there at the Curtis plant in your presence? A. Yes. We continued to work with the Curtis Company from that time up until some time, I guess, around the end of August of the following year, 1933. We made constant experimental runs, and some productions during that period.

Q. During this period did you actually sell them some of the ink? I mean that was given for test purposes? A. Oh, we sold quite a little.

Q. Have you made, from your books, a record of the ink which you sold to Curtis? A. This indicates that some of these were paid for and others were in the nature of an experimental lot.

Q. These are notes taken from your account books? A. Yes, sir.

Mr. Byerly: I will offer these in evidence.

The Court: Did you make up the ink for all the experimental runs you made for the Curtis Company?

The Witness: Yes, sir. That is, I did not do (111) it all myself.

The Court: I mean, done by Sinclair & Carroll Company, the defendant?

The Witness: No, it was done by the Cray-Finne Company.

The Court: What was the connection with the defendant, Sinclair & Carroll Company?

The Witness: We had no connection, simply competitors, friendly competitors.

Mr. Free: I object to this list of sales in the record, your Honor. We are getting an awful lot of stuff in here which is immaterial, secondary evidence. Who cares how much ink was sold to Curtis. The witness said he sold some. I think that ought to be enough for the record.

The Court: Objection sustained.

By Mr. Byerly:

Q. Now, Mr. Cray, you said you made up these inks. Where did you get the varnishes or vehicles which you used in it? A. Zinsser & Company.

Q. Is that the company of which Dr. Gessler was the chief chemist? A. Yes.

Q. And they, as I understand, furnished you with the varnish or vehicle of ink, and what you did was mix in the pigment? A. That is right.

(112) Q. When you first started working there at Curtis, did they insist on knowing what was in this ink? A. Why, shortly after the experiments began they did, yes.

Q. Did you then check with Dr. Gessler and find what was in the ink? A. Yes.

Q. What solvent was in it? A. Butyl carbitol.

The Court: Who had made up this ink, Gessler or you?

The Witness: Zinsser, or Gessler's company, made up the varnish and sent the varnish on to us; and we added the pigments, ground them and canned them and shipped them.

The Court: Gessler made the varnish, and you did what?

The Witness: We put the pigments into them and processed them, which means grinding on a roller mill.

Q. The butyl carbitol, as I understand it, was the solvent which was contained in the varnish which was sent to you by Dr. Gessler and the Zinsser Company? A. That is right.

The Court: The butyl carbitol was in it when you got it?

The Witness: Yes, sir. We did add more butyl carbitol in some instances as a thinner. After we got the varnish, we of course always had butyl carbitol to (113) work with.

Q. Were you the regular ink suppliers for the Curtis Publishing Company? A. No sir.

Q. Who was? A. Frederick H. Levey Company.

Q. When you were over to the Curtis Publishing Company did you ever see this ink which you made from Dr. Gessler's varnishes running on the same press with another ink made by someone else? A. I did.

Q. Just describe how that was arranged, what you saw in that connection. A. Well they usually had four pages. Each was on a form, what we call a form. They had split the fountains and the rollers in the middle, and were running two pages with our ink and two pages with a competitor's ink. They were running side by side, and going over the same heating unit, and drying almost alike.

The Court: Two different inks appeared on the same page?

The Witness: Yes—not on the same page, on the same sheet. They split these pages, which were four in a row. That is, what we call the form. The form

consisted of eight pages. There were four across and four this way (indicating). They were split in the middle, two pages, and running on this page—the same ink on four pages on this side, and different ink on four pages (114) on this side. In other words, if this is the roller, you cut it in two and put one ink on one side and one ink on the other side.

Q. How long after you started these tests and informed Curtis of the ingredients contained in this ink—how long after that was it that you saw this competitor's ink running alongside of yours on the same printing press over there?

Mr. Free: Your Honor, I object to this question. I do not see any connection between this defendant and this other ink, or the present status of the case and this other ink. It is all immaterial.

The Court: The other ink is not involved in the case, is it?

Mr. Byerly: The other ink is made by a company that is now one of our licensees. I think this is important, your Honor. The commercial development of the ink brought it right up to the point where the defendant took it, and I would like to show that. I can show it in rebuttal if your Honor prefers, but I thought it would be useful. It may possibly have a bearing on the question of infringement.

The Court: All right; go ahead.

Mr. Byerly: Now will you read the question?

Q. (Read.) A. I think that I furnished Curtis (115) with full information in regard to the ingredients used in our inks along in March or April—not later than that. I think this was July or August that we saw this competitor's ink running on the same press as ours was.

The Court: What year was that?

The Witness: 1933.

Q. Now was Dr. Gessler with you when you saw this competitor's ink running? A. He was with me that day; yes, sir.

Q. Could you tell what the solvent was in this competitor's ink? A. Well, I made a guess at it.

The Court: Don't guess. Do you know?

The Witness: Yes. I think it was a petroleum solvent. You could smell it. It was all over the place. When it went over the steam drum there was a very definite odor of petroleum solvent there. I decided they were using a petroleum solvent.

Q. After you had seen this ink, and some time in the early part of—you say you saw it in 1933—some time in the early part of 1934 did you do any work in connection with trying to find a substitute for this solvent, butyl carbitol, in the ink you were making? A. I did it before 1934. I started working in 1933 on that problem. In fact, I started working shortly after my last visit there (116) to Curtis, when I discovered that they were trying petroleum solvent or running it.

Q. Just tell us what your work in that direction consisted of? A. Well, I undertook to get a petroleum solvent that would give the same results or do the same job that butyl carbitol did, but I am frank to admit that I could not find them in the market. There was just no such animal available, that is, that would give me all the advantages that butyl carbitol would. So I had some friends in the oil business, one of the large oil companies, and I went to him and told him my problem, and he introduced me to one of their chemists, and we discussed my problem. I remember I told him that what I wanted to get was a petroleum solvent of about the same boiling range as butyl carbitol. I figured that if I could get that I would be on the right track. I went to work then with that oil company, and probably two or three months after that time, or in the early part of 1934,

the beginning of 1934, I got from this oil company some very special petroleum solvent cuts which I found were pretty much in line with the boiling range of butyl carbitol.

Q. Did you check the drying of these inks that you made up from these petroleum cuts with the drying of the butyl carbitol inks which you had? A. Yes. I always (117) used that as a yardstick to check on.

Q. What was the name of the oil company from whom you got these very special cuts that you found to be like butyl carbitol? A. Continental Oil Company.

Q. I show you what purports to be two letters from the Continental Oil Company, and ask whether from these you can refresh your recollection as to about the time you were doing this work (handing to witness)? A. Well, this letter indicates that we started this work in the early part of April 17th. However, I am inclined to believe that I might have done a little work even before that first letter.

Q. In what year? A. 1934.

Q. 1934? A. Yes.

Q. You think you started a little before April, 1934? A. Yes.

Mr. Free: Again I would like to interpose an objection as to materiality and relevancy, your Honor. Who cares whether they were working on something else besides butyl carbitol? The patent says butyl carbitol, and therefore it is immaterial if they were working on petroleum solvent or something else.

Mr. Byerly: I think, your Honor, the fact that they found they could make petroleum solvent having the same vapor pressure, and that it was a fairly obvious (118) following up of what the patent says, and this witness himself has described that having worked with the exact illustrative embodiment given in the patent for some time, that he found, not by buying petroleum on the market but by getting a special petroleum cut that had a vapor pressure like

butyl carbitol, he made the same ink. Now I think that bears on the question of infringement, because the petroleum solvent—I will ask the witness that, if I may.

Q. How does the expense of butyl carbitol compare with the expense of petroleum solvents? A. Well, it is about eight times as great, I would say. That was one of the reasons for looking for something cheaper.

Q. And so these hydrocarbons, these inks that you made of hydrocarbons, these cuts which acted like butyl carbitol, with the same vapor pressure, were much cheaper than an ink made with butyl carbitol—is that correct? A. We had a varnish cost of 9 or 10 cents as against a varnish cost of around 31 or 33 cents.

Mr. Free: Even so, your Honor, maybe there was invention made when someone discovered petroleum solvent, but it is not in this patent. All we are concerned with here is butyl carbitol.

. . . . . .

(124) The Court: I will overrule the objection.

By Mr. Byerly:

Q. Mr. Cray, you have just used these letters to point out that it was in the early part of 1934 that you succeeded in substituting this cheaper solvent for butyl carbitol? A. That is right.

Q. Were you at that time aequainted with Mr. Goldthwaite who, I think, was then president of the plaintiff corporation? A. Yes. I met Mr. Goldthwaite on two or three occasions prior to that time.

Q. Do you remember Mr. Goldthwaite writing you for an appointment at the time you were working out these hydrocarbon solvents that were to be used instead of butyl carbitol? A. I do.

Q. Have you looked through your files for the letter (125) you got from Mr. Goldthwaite at that time? A. I have, but I have not been able to locate the original letter.

Q. Can you remember whether he came to see you that Spring after he had written you? A. Yes, he came in April 1934.

Q. Did you demonstrate to him a quick-drying ink which you had made on Dr. Gessler's varnishes, the quick-drying ink which had butyl carbitol in it? A. Yes. I made proofs of both kinds and gave him a general demonstration in the laboratory that evening.

Q. And did you tell him how to select a hydrocarbon which could be substituted for butyl carbitol? A. Yes, sir.

Q. What did you tell him in that connection? A. I told him "If you have a petroleum solvent of about the same boiling range as butyl carbitol you have a solvent that in most cases would be perfectly satisfactory for making printing ink out of."

Q. And you mean by that making an ink that could be dried by heat? A. That is right, a substitute for butyl carbitol ink.

The Court: We will take a recess for ten minutes at this point.

(Short recess.)

Q. Mr. Cray, at the beginning of your testimony you (126) spoke of the fact that since you have been with the plaintiff you were selling inks called Vaporin that are dried by heat on this press, such as you have explained. Now are those inks which the plaintiff has sold since you have been with them for heat drying? Are they made with this solvent butyl carbitol that was in the first varnishes you got from Dr. Gessler or are they made with these cheaper solvents which you found could be used in place of butyl carbitol? A. Most of them are made with the cheaper solvent. A very small percentage of the total is made with

the butyl carbitol solvent for specific or special purposes.

Q. And the solvent in the majority of them consists of these very narrow petroleum cuts such as you obtained from the Continental Oil Company when you were working on this? A. That is right.

The Court: Very narrow what?

Mr. Byerly: Petroleum cuts.

Q. Just tell the Court what you mean by a very narrow petroleum cut. I am not sure whether it was explained. A. A very narrow boiling range of a petroleum solvent. It may be, as was described here, cutting the tail or the initial point off of kerosene. To be most effective and to be more like butyl carbitol they have to have a narrow boiling range. Most petroleum solvents (127) that you can go out on the market and buy might have boiling ranges that run from 100 to 150 degrees from the initial point to the end point. Now those that we used generally have 20 or 22 degrees from the initial to the end. Butyl carbitol I believe has only 11 points from the initial to the end.

Mr. Byerly: That is all.

Cross-examination by Mr. Free:

Q. Mr. Cray, as I understand it, you were aware that the competitive ink used at the Curtis Publishing Company was a high boiling petroleum fraction ink? A. I suspected that it was, yes.

Q. When was that? When did you first see it? A. About in August 1933. It might have been July. I could not swear to that. It was in the hot days, July or August.

Q. That is close enough. And so far as you know the Curtis Publishing Company are still using an ink containing a high boiling petroleum fraction? A. Yes, they are.

The Court: A high boiling what?

Mr. Free: Petroleum fraction—the same "cut" we have been talking about as "petroleum cut".

The Court: You mean that boiling point had a wide range or high point?

(128) Mr. Free: High boiling, narrow range.

Q. At that time you were still using a butyl carbitol ink? A. In our experiments at Curtis, yes.

Q. And when did you change to a petroleum solvent? A. Well, I changed—the Cray-Finne Company changed to a petroleum solvent shortly after that. I had started just prior to that time experimenting with petroleum solvents or we were making some of our inks out of petroleum solvents shortly after that time. However, we had certain business in which we were using butyl carbitol and we continued to buy that also from the Zinsser Company for some time after August 1933.

Q. And when your company was bought out by Interchemical or International Printing Ink, you were then using a high boiling petroleum fraction in your inks, were you not? A. Some of them, and we at that time still were using some butyl carbitol inks for special purposes.

Q. Yes, but the amount of butyl carbitol ink became less and less in volume? A. It certainly did.

Q. Now you spoke of the Paterson Parchment Company test. When was that again? A. May 1932, I think.

Q. And as I understand it, from your previous testimony, those tests continued for several months? A. Yes.

(129) Q. And then after several months' experimentation the Paterson Company gave up the use of the ink? A. That is right.

Q. And that was a butyl carbitol ink? A. Yes, sir.

Q. And one of the reasons they gave it up was because it cracked the ink rollers, didn't it? A. No.

Q. What was the reason? A. I do not think that is quite right. They gave it up mainly because they found

that our crude heating unit had a tendency to distort or take the glycerin out of their paper. It was very important that the moisture not be removed from their paper because that paper was used mainly to pack butter and cheese, and to take the moisture out of it and distort the parchment paper itself made it useless as a wrapper. I would say that they gave up the experiments mainly because the chemical department found that by passing this paper over this steam drum we distorted it, took too much moisture out.

Q. You never sold any ink to them any more? A. Oh, I am selling a lot to them today.

Q. At that time, after the experiments at Paterson? A. Oh yes, after suitable heating equipment was gotten they started using it. Now we have heating equipment available that you can use, that you can run parchment through without distorting it, so they are buying a very (130) substantial amount of their total inks, of the heat-drying type inks today.

Q. With petroleum solvent? A. With petroleum solvent and butyl carbitol. They do use some butyl carbitol for one or two jobs where the question of odor is of vital importance, and I still think we use butyl carbitol.

Q. You are not sure of that? A. Yes, I am sure of one or two.

Q. The reason I am asking you whether you are sure is because in answer to some questions your counsel said that you were selling only a small proportion to the Kalamazoo Parchment Company since 1936. A. Well, that is another company. That account does not happen to be in my district and I am not familiar with the sales situation there.

Mr. Byerly: I think I should say at this point that the answer to the interrogatories stated that we were selling it and we were asked to name a customer and we named this Kalamazoo Company

as a customer, but there was no statement in the answer that it was not sold to other customers.

Mr. Free: I will pass that at this time, but the question was asked to name all the purchasers of butyl carbitol ink and only one was named.

Q. Now in the test that you mentioned at Curtis (131) Publishing Company, you continued to try to use your butyl carbitol ink for a period of about a year down there, did you not? A. Pretty close to a year, nine months or ten months.

Q. And during that time the Curtis Publishing Company gave you all the cooperation you would want? A. They certainly did.

Q. And after that time they gave up the use of the ink, is that right? A. That is right.

Q. And one of the reasons for it was that the rollers cracked and sometimes were so badly cracked the presses had to be shut down? A. That is right.

Q. So far as you know the Curtis Publishing Company never has used any butyl carbitol ink since that time, is that right? A. No, I don't think they have.

Q. The date when they gave it up, that Curtis gave it up was about May 1, 1934; is that about right? A. Yes, I think that is right, about May 1st. I think it was a little bit later than that.

Q. I show you a letter addressed to you, Mr. Frank W. Cray—that is you, isn't it? A. That is right.

Q. —dated May 1, 1934, from Mr. Sterner. Do you recognize that (handing to witness)? A. Yes, that is right.

Mr. Free: That last paragraph explains the (132) situation, your Honor (handing to Court).

The Court: (After reading.) Well, was this butyl carbitol or not?

Mr. Free: Yes, your Honor.

Q. This letter happens to be a carbon copy, but you remember receiving the original? A. Yes, from Sterner.

Mr. Free: I offer in evidence as Defendant's Exhibit B the letter from Mr. Sterner, dated May 1, 1934.

Mr. Byerly: If your Honor please, I object to this exhibit unless the exhibit showing the amount of ink which had been sold to the Curtis Company should be admitted also. This particular letter indicates that a certain quantity was returned at a certain time and it means very little unless there is on the record a complete statement of the amounts delivered and paid for. I offered that during the direct examination of this witness but was ruled out as immaterial. I should like to object on the same grounds of this letter, or else have your Honor permit me to re-offer the total sales.

Mr. Free: Well, I am merely using this letter to fix the date.

The Court: This letter is merely used for fixing a date and also in response to the Court's question if appears that this ink used was butyl carbitol, which (133) was a failure.

Mr. Free: Yes.

(Marked Defendant's Exhibit B.)

Q. Now you spoke about the ovens through which the web passes after being printed. Those are pretty hot, aren't they? A. Yes.

Q. About how hot? A. Well, they get up to say 1200 or 1500 degrees Fahrenheit in the oven.

Q. And if the web should stop and you did not have the safety devices the web would burn, wouldn't it? A. Well, I don't know. I don't think there is much chance of it, of its burning, because you print all your national magazines that way, and if there were many fires they would not be able to get the magazines out.

Q. But they have safety devices when the web stops—A. It automatically cuts the gas off.

Q. What I would merely like to say, if it is fair, is that, at that temperature the web would burn if it were not moving so fast; isn't that right? A. If it came in contact with the flames it would, but the flames are not directly on the paper, you know. They are an inch fo an inch and a quarter away from the paper. Now if the web broke and pieces of it flew into the heater naturally you would get a fire; but in the ordinary course (134) of events I do not suppose they have one fire in a month on these presses.

The Court: How often does the web stop in passing through there?

The Witness: Well, a web might stop every hour for one thing and another, but usually on these high-speed presses they refill their fountains and they do everything automatically, and it is no uncommon thing for this big machine to start rolling on a magazine like Life and not stop for eight or nine hours, run right through. They change paper without stopping. They have these automatic pasters and put new rolls on. All they do to make that change is slow the speed of the presses down. Otherwise they may stop the machine every half hour.

The Court: Is it your testimony the paper would not burn if the web stopped at that temperature of the heater? Would it scorch?

The Witness: Well, you have to understand, your Honor, that these things are automatically controlled and just the instant that the press starts to slow down your gas starts to turn off.

The Court: Well, that is not what I asked you. But if the gas stayed on there and the same rate continued and the web stopped wouldn't the paper be burnt or scorched?

(135) The Witness: It certainly would; no question about that.

The Court: It is obvious.

Q. It would evaporate almost anything that was on the paper, wouldn't it? A. Yes.

Q. That was one of the troubles you found with the Paterson Parchment Paper Company. The heat was too great for the moisture in the paper, wasn't it? A. Well, the crude heating unit that we had was not properly constructed. As I said before we are today doing a tremendous amount of this kind of ink with Paterson because we have learned how to build a refined unit, heating unit. We do not use gas in all heating cases. We resort to the use of steel steam drums and also to the use of plain hot air in some cases, and we also use in these extra fast presses a combination of a hot oil drum, a ribbon burner and hot air in addition to that. All three types are used on some of the presses today.

Q. As I understand it, Dr. Gessler sent you varnishes? A. That is right.

Q. Containing butyl carbitol? A. Yes, sir.

Q. And you being an ink man made ink out of them? A. That is right.

Q. And that was quite a job, wasn't it? A. Yes.

(136) Q. You tried many months before you got a suitable ink, and one of the reasons for it is that you have to fit the ink to the particular job and the paper you are working on, isn't that right? A. That is right.

Q. And almost every time you were called upon to supply ink to a customer you practically have to make a new ink, don't you? A. Well, there are a great many tailored jobs in the ink business.

Q. First you have to find out what sort of paper he wants to print on, is that right? A. That is right.

Q. Then you want to find out how fast the paper should pass? A. That is right.

Q. And you have to know what kind of a press he is working on? A. Yes, sir.

Q. Oh, there are three or four or five different variables that you have to take care of each time you make an ink; isn't that so? A. Yes.

Q. So an ink maker is pretty much of a custom tailor, isn't he? A. Yes, I would say he is.

The Court: You do not carry ink in stock, do you?

The Witness: Oh, yes. There is a certain percentage of the average ink maker's ink which is a standard item taken off the shelf. Possibly 40 per cent and 60 per cent might be special items, highly special items.

(137) Q. You keep up with modern developments in resins, do you not? A. I think so.

Q. You use them whenever you can and price permits? A. Yes.

Q. And solvents the same way? A. Yes.

Q. And pigments the same way? A. Yes.

The Court: What is it that makes the impression on a paper, is that the residue?

The Witness: It is a combination of the resin and the pigment, I would say. When you take your solvent off then you have the pigments and the resin solid left, that is all.

Q. Essentially what does any ink consist of? First you have your pigment, then you have your vehicle, and then in the third class you have— A. Extenders.

Q. And dryers and plasticizers? A. And compounds.

Q. In general ink has always been made that way? A. That is right.

Q. And for certain presses you have an ink which is thick, like typographic? A. Yes.

Q. Other presses you have an ink which is thin like rotogravure for, and then you have inks between, of different degrees of thickness and viscosity? A. Yes.

Q. When an ink is too thick for a certain press you thin it by putting in a solvent usually, don't you? (138) A. If you are working with these oils, you would certainly use a solvent, that is right, but if you were working with a linseed ink you might use a straight, raw linseed oil or a boiled linseed oil. Maybe you would not mix a solvent into the linseed. You would either use the solvent or an oil.

Q. I have often heard inks compared to paints, they are similar, aren't they? A. In some respects.

Q. That is, you have a pigment and you have a vehicle which is oftentimes linseed varnish, and then you have dryers sometimes and sometimes plasticizers? A. Yes.

Q. And these Duco lacquers which you remember back in the early 1920s, they began coming out with solvent solutions of nitrocellulose? A. Yes.

Q. And they evaporated pretty fast and caused what was called the orange peel effect, you remember that? A. Yes.

Q. So they improved that by putting in solvents which did not evaporate so fast? A. Or plasticizers.

Q. And after nitrocellulose was invented or placed on the market, you got a whole series of different solvents for it, do you remember that? A. Yes.

Q. And then after that, other synthetic resins like bakelite came along and then you had to have different solvents for that too, isn't that right? (139) A. That is right.

Q. So the ink business, like the paint business, has been in a state of constant change as new products come on the market, to get advantage of them both for price and for quality, is that right? A. That is right.

Q. Going back to some of this early work you did with Dr. Gessler, it was you, I believe, who suggested the use of heat with this butyl carbitol ink, did you not? A. Well, I don't know as I suggested it. I thought about it a good

deal and it occurred to me, since we were working with pigments that were somewhat similar to lacquers, that it might be possible to handle them somewhat similarly to the way they were handling lacquers, like on automobiles. That is the idea I had in mind, and I told him I had this press out there that I thought I could put some heat on, and I asked him if he would make an ink that would print under those conditions, that would stay stable, and if we could put some ink on it we could try it. He said not only he could, but he had already made it. He named one of the inks he originally sent us as an odorless ink.

Q. And so you tried heat on it and the solvent did evaporate? A. It certainly did.

Q. It is possible also that the idea of using heat was suggested by the rotogravure practice, is it not? (140) A. Yes, I had often thought of that, because there was a great big rotogravure company in the same offices, and it used to break my heart to go down and see them dry by going over some drum, but I realized we had this stability problem and the question of keeping the ink stable on the press.

Q. In this rotogravure process the ink is applied to the web from the— A. The engraving itself, right from the roller. The work on rotogravure is etched underneath the surface. When we talk about letterpress print we are talking about relief printing, or above the surface. This rotogravure cylinder which has all the work on travels right in a big trough of ink. Then the steel doctor blade scrapes the excess ink off, and the balance that is in the pockets below the surface is transferred onto the paper. They have no question of rollers at all.

Q. Then this ink which is deposited on the paper, this fast moving web, is heated and the solvent is driven off, and then you have your Sunday supplement and other magazines that are printed each day? A. That is right.

Q. As I understand it, for letterpress printing you merely use a higher boiling solvent that would not evaporate on the rollers? A. That is right.

Q. Otherwise you had an operation which was very much like rotogravure, the application of heat to the web? (141) A. That is right. Of course, there is a great deal of difference in the amount of heat you have to apply, because with these new closed rotogravure fountains they can use very highly volatile solvents.

Q. It is just a matter of heat. If you have a low boiling solvent you use less heat, and if you have a high boiling solvent you use more heat? A. That is right.

Q. Have you ever seen a hot air dryer which works with Vaporin ink? A. Yes, I have. I built the first one I think myself.

Q. That has a fan in it and it blows air across heating tubes? A. Yes.

Q. Then the air strikes against the web and dries the solvent, very much like a rotogravure heater? A. Very similar.

Q. Only the temperature is higher? A. Only the temperature is higher and it takes a much longer web traveling in that unit than it does on a rotogravure. We are usually forced to run 15 up and 15 down and get 30 feet in the unit in order to get the drying.

Q. What happens to the solvents that are driven off in rotogravure and in Vaporin ink? A. In the Vaporin ink with these hot air units that is one of the advantages. Our heating plant there, the way we heat up our air is we use gas and we take the residue and bring it back and (142) burn it up in the gas furnace; and in rotogravure in the large plants they are reclaiming most of the solvents now. They find it economical to reclaim the solvents.

The Court: Which is the better practice, to use these things with a dryer or to use the heating unit?

The Witness: It all depends on the job. I think a little explaining might be in order. For printing coffee bags and things like that, the hot air unit is better, for this reason, that they only print on one

side of the paper, you see, and you can do many things that way, and the speed is not so paramount as it is on these big magazines. On this type, with the web running anywhere from 700 feet to 1000 feet a minute, you could not use hot air because it would take too much time. You would have to be in there for twenty or thirty seconds in order to do it. So therefore they have to go to extremely higher temperatures for the short period in the heater. The variables are time and temperature. Where you are printing on one side of a web like on coffee bags, you come in here, travel up through your heating unit, and there is not any particular speed problem. You are only printing on one side of the paper as against both sides. So I think you can say that for some operations the hot air method is superior and better than other ones, (143) and for high speed magazine operations that other type of unit is the most satisfactory and most universally used.

The Court: They both use heat.

The Witness: Yes.

The Court: I mean between heating and a self-drying medium that does not need to be heated.

The Witness: A self-drying or oxidizing drying type of ink may take eight hours or maybe 24. We dry in a split second.

Re-direct examination by Mr. Byerly:

Q. You knew about rotogravure printing before you ever saw Dr. Gessler's ink, didn't you? A. Surely.

Q. You knew that was dried by heat? A. Yes.

Q. At that time did you know how to make typographic or letterpress ink that could be dried instantly by heat? A. No, I did not.

Q. You were never able to make such an ink, were you, until after you had used Dr. Gessler's butyl carbitol? A. I never made one at all until after I did.

Q. This letter, Defendant's Exhibit B, from the Curtis Company, refers to returning a certain amount of butyl carbitol ink which you sent them? A. Yes.

Q. Was this the entire amount of butyl carbitol ink you sent them or did you send them others that they (144) actually paid for and used? A. I think that that might be a little confusing, I think, the time Mr. Sterner wrote that letter that he was sending back all the butyl carbitol ink that we had over there, that they had not used and had not paid for.

Q. But were there some others that they had used and had paid for? A. Oh, yes, sir.

Q. You made a record of that in your books, did you not? A. I did. That record shows those that were paid for and those that were sent and returned. The whole story is there.

Q. Will you refresh your recollection from this and tell us the amounts of ink which you sent them which were paid for? A. Do you want me to add these amounts up?

Q. Just read the amounts that were paid for and the dates they were shipped.

Mr. Free: This is just putting in by indirection what we ruled out before.

The Court: If he can testify of his own knowledge that is all right, otherwise it is not. If you recognize those figures to be correct of your own knowledge, why you can give the answer.

A. I think this list is substantially correct. I think you have invoices to indicate those that were paid for and those that were not. I would say this is (145) correct.

Q. Then will you please answer the question, which is, what were the quantities of ink which were sent and paid for? A. In February we shipped 50 pounds. I think I would have to have the invoices.

Q. You have referred to certain invoices. I have the invoices to which you refer. A. I see here June 12th, there

were 30 pounds of ink shipped to them which they paid for. June 21st——

The Court: What year.
The Witness: 1933.

A. (Continuing) June 21st, 1933, 75 pounds, paid for. June 26th, 1933, 229½ pounds paid for. All this ink, 9241, was paid for in full and none was ever returned to Cray-Finne Company. August 11th, 1933, there was a shipment of 100 pounds, paid for in full, none returned. August 16th, 1933, 200 pounds, and another 110 pounds, paid for in full and none returned. February 1933, 50 pounds. March 50 pounds, all paid for. None returned. That covers it.

Q. Then if I understand you correctly, this letter, Defendant's Exhibit B, refers to ink that they had on hand when they decided to give up using this ink, which they then sent back. A. I think that was most of the last few shipments that were not satisfactory probably.

(146) Q. Did the Curtis Company make any complaints to you about the price of this ink while they were buying it from you? A. They certainly did.

Q. Did Mr. Sterner give you any explanation or did you gather from him any reason he had for changing to another ink?

Mr. Free: That is hearsay, your Honor. I do not think that helps any.

Q. I think you said that after stopping using your ink, the Curtis Company continued to use the heat drying ink made with a cheaper solvent, is that correct? A. They certainly did.

Re-cross examination by Mr. Free:

Q. This heat drying ink you said Curtis continued to use, was not purchased from your company, was it, after

1934? A. It was not purchased from us up until a year ago.

Q. Do you know whether that came from Levey? A. Yes, practically all of it came from Levey.

Q. And the ink you have been selling them since last year has been a petroleum solvent ink? A. Yes.

Q. Curtis uses a lot of ink? A. Yes.

Q. They buy it by the carload? A. They are one of the largest consumers of printing ink in America.

Q. These small samples you sent them were mostly (146A) experimental inks, were they not? A. Yes.

(Adjourned until Tuesday, January 19, 1943, at 10:30 a. m.)

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(147) New York, January 19, 1943;
10:30 o'clock a. m.

TRIAL RESUMED.

Mr. Byerly: Your Honor, I should like to begin by offering parts of some depositions which were taken by the defendant in Chicago, and I believe these depositions are on file with the court. I can indicate the portions that I wish to offer. I do not know whether your Honor wishes to have them read, or what procedure you prefer in that matter.

The Court: I think it will be well to have them read.

Mr. Free: I think that we might save time. I am going to put the whole deposition in when it comes my turn, and it is a defendant's deposition.

Mr. Byerly: I want to read just certain parts of it that bear on the plaintiff's case, particularly on the testimony which has been given by Mr. Bragdon, and I thought to put in these parts as part of my case is proper.

The Court: I think that is right, and you can (148) eliminate those parts when you come to yours.

Mr. Free: I think it would be a little less confusing to read the whole business together.

Mr. Byerly: I do not think the parts will be at all confusing, your Honor.

The Court: The witness's testimony was taken on behalf of the defendant?

Mr. Byerly: Of the deposition of the witness William A. Magie I will offer questions and answers 1, 2 and 28 to 38.

Extracts read in evidence from deposition of William A. Magie, produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Please state your name. A. William A. Magie.

Q2. You are connected with the Magie Brothers Petroleum Products Company at 1640 Carroll Avenue? A. That is right.

* * * * * * * *

Q28. Is this Sample II, solvent 502-C, what you would call a narrow cut? A. Yes; yes.

Cross examination by Mr. Byerly:

Q29. How long have you been in the business of selling oils for use as solvents? A. Since the middle to the end of 1938.

Q30. Did you sell any oil before 1938? A. A solvent?

Q31. Yes. A. No solvent. We have been in business for fifty-three years.

Q32. I see. A. Fifty-four years.

Q33. Did you make this narrow cut before 1938? (149) A. No, sir.

Q34. Did you find there was a demand for narrow cut oils as solvents in 1938? A. No; no, we did not.

Q35. Why did you start to sell them then if there was no demand? A. You mean—we started to sell them in 1938, the middle or the end of 1938, because we had requests for oils of that type.

Q36. And, if I understand you correctly, this was the first time you had requests for oils of that kind? A. That is correct.

Q37. Did these requests indicate the purpose for which these oils were to be used? A. Yes; yes, they did. They were to be used in this quick-dry type of printing.

Q38. You have sold narrow cut solvents to the International Printing Ink Company, or Interchemical Company, have you not? A. Yes.

The Court: What is a narrow cut?

Mr. Byerly: A narrow cut is what they call a petroleum fraction with a very narrow boiling range, that is, it is like butyl carbitol in that it does not spread out over a long boiling range but has a very narrow boiling range, and uniform evaporation.

The Court: Boiling temperature range?

Mr. Byerly: Yes, you take a wide cut like kerosene, it is a mixture of so many things that it will (150) start to boil at a fairly low temperature, and you have to keep increasing that temperature, perhaps a hundred degrees, before it is all boiled away; because it is such a mixture, so it does not evaporate uniformly.

Now the deposition of defendant's witness John Krawetz. In this deposition I would like to read questions 1 to 4, 9 and 10 and 44 to 53.

Extracts read in evidence from deposition of John Krawetz, produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Please state your name. A. John Krawetz.

Q2. You are connected with the Phoenix Chemical Laboratory, Inc., of 3953 Shakespeare Avenue, in Chicago, are you not? A. Yes, sir.

Q3. What is your capacity? A. I am the President of the Company.

Q4. Will you give me a brief outline of your education and training along the lines of chemicals and fuels? A. I was graduated with a Bachelor of Science Degree from Northwestern University in 1923, and was awarded my Master of Science Degree in 1934, at which time I decided to devote myself exclusively to the study of petroleum and petroleum products, and in that manner I started to work as an engineer and investigator, and finally developed my own laboratory, and have been operating the Phoenix Chemical Laboratory ever since, and we are devoted exclusively to the study of petroleum products.

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(151) Q9. Now will you describe briefly what you mean by A.S.T.M. tests that you mentioned? A. The American Society for Testing Materials has established procedures for examining various types of products, amongst them petroleum products.

Inasmuch as petroleum products are, in the main, mixtures of hydrocarbons rather than single chemical identities, it is necessary to very definitely establish the test procedure, because unless you definitely establish the test procedure insofar as, let us say, the distillation is concerned, you may obtain all kinds of results.

In other words, if you distill a mixture of materials by various methods, you will get various distillation ranges,

which is not true in the case where you are dealing with a chemical identity, just one chemical compound.

Therefore, the American Society for Testing Materials has definitely prescribed the flask in which a distillation is carried out. That is, the dimensions of the flask; the position of the side arm on the neck; the diameter of the neck of the flask. They have definitely described the position of the thermometer. They prescribed the rate at which heat is applied to induce distillation. They prescribed the cooling bath.

(152) So everything that is variable, that is, in test procedure, is established because, we have no control over the mixture of the material; that is, we can control the distillation range of the material, but we cannot control the concentration of the individual molecules of hydrocarbon present in the mixture.

So we have to definitely control the test procedure, so that laboratories in different parts of the country and different parts of the world can obtain similar reproducible results.

By Mr. Byerly: I might say in explanation that is the test by which the boiling range we have referred to is established. That brings me to Q44.

Re-direct examination by Mr. Free:

Q44. These hydrocarbons, such as 502-C oil, are in what hydrocarbon series, approximately? A. Well, this material would be a very narrow cut; it might be the very end of the kerosene range, and it might be just a little from the low end of the distillate.

But, in general, this is specially prepared material, because your kerosene and distillate overlap, and you would find that your distillate—within your distillate oil, your fuel oil, would have a lower initial boiling point than this. This is a specially provided fraction.

Q45. That would be in the pentadecane up to the (153) octadecane series? A. Yes, because there are so many branches which increase the boiling points, and so forth. So, at the end; the tail end of kerosene; you might term it.

Re-cross examination by Mr. Byerly:

Q46. You say this is a narrow cut. What is this boiling range of 502-C? A. The boiling range is from 505 to 549 Fahrenheit. It is a 50-degree cut.

Q47. It is really less than 50 degrees; about 4— A. 44.

Q48. 44 degrees, Fahrenheit? A. Yes, 44 degrees Fahrenheit. But that is a mighty close cut. You can call it 44 if you want to; but in refining operations two or three degrees either way means very little, because you are dealing with mixtures and you have big equipment. Your equipment is accurate but not precisioning equipment.

Q49. What is the ordinary boiling range of the ordinary kerosene? A. Oh, the boiling point of kerosene might start in at 380, 375, although they used to run it through, get it at times at almost 600; but the good kerosene will run from 385 to 520.

Q50. That is the boiling range, 140 degrees Fahrenheit, is that right? A. Yes, that is right.

Q51. How about fuel oil, what is the boiling range of that? A. Well, that depends whether that is a No. 1, (154) 2 or 3 distillate, and if you term that the fuel oil, you may say it is around 380 and runs up to the very heavy stuff that will crack before it will distill.

The Court: What does "crack" mean? That means breaks up into its component parts?

Mr. Byerly: No, it means that the heavier hydrocarbons in it break up into lighter hydrocarbons, instead of going off into gas when you heat. That is the process, as your Honor probably knows, of making gasoline out of heavy oil. It is a heating

process that breaks these big molecules up into small ones in the same series.

Q52. What is vapor pressure? A. Vapor pressure of a material is the pressure developed by the substance against the atmosphere. You see you have several materials, like hydrocarbon mixture, millions of little molecules. Some of them have energy driving them out; others are coming in. Now, the force generated by those trying to get out against those that are falling back, and the resistance they exert against the atmosphere is your vapor pressure.

Q53. If the liquid is actually boiling, what is it? A. 760, under ordinary atmosphere. Now, like today, if your barometer is 750, then the boiling liquid is 750. Then again, if you put pressure on it, then that is (155) different. But under ordinary atmosphere, generally speaking, it is 760.

Mr. Byerly: I will now call Dr. Gessler.

ALBERT E. GESSLER, called as a witness on behalf of the plaintiff, being duly sworn, testified as follows:

Direct examination by Mr. Byerly:

Q. What is your present position, Dr. Gessler? A. I am director of research of the Interchemical Corporation.

Q. You are a graduate chemist, have a Doctor's degree in chemistry? A. Yes. I graduated with a Ph. D. degree from the University of Berlin.

Q. And you have been engaged for many years in industrial chemical work in the United States? A. Yes, since the year 1910.

Q. Were you ever chief chemist of Zinsser & Company? A. Yes, I was. I was chief chemist and a member of the board of directors.

Q. What was the business of Zinsser & Company? A. They were makers of chemicals and pigments and dyes.

The Court: Is that Zinsser?

The Witness: Zinsser.

Q. Where were they located? A. They were located at Hastings-on-Hudson.

(156) Q. When were you with them, Dr. Gessler? A. From the year 1926 to the year 1934.

Q. Did Zinsser & Company sell any pigments to Cray-Finne Company? A. Yes, they did, for a long time.

Q. What was the business of the Cray-Finne Company? A. They were makers of printing inks.

Q. Were you acquainted with Mr. Cray of that company? A. Yes, personally.

Q. Did Mr. Cray ever take up with you any problem in connection with printing ink? A. Yes, he did.

Q. When was that and what problem did he put up to you? A. That was in the year 1930. It happened that at that time at a meeting with Mr. Cray he explained to me that there would be a large outlet for odorless inks for the purpose of printing food wrappers, particularly on parchment paper, and he asked me at that time if it would be possible to make an odorless ink. He told me that they had tried for years to make odorless inks and had failed and he wondered if I would be able to make an odorless ink for that purpose. The reason that he had a suspicion or an idea that I might be able to make such an ink was that he knew——

The Court: Is this what he said to you or is this what you understood? Just state what he said in a discussion at any time, not what you thought, but (157) what he said to you.

The Witness: Well, I could not repeat it verbally. That is in the year 1930.

The Court: Give the substance.

The Witness: The substance was, could I make odorless inks for him. He also told me that he had failed to make odorless inks himself.

Mr. Free: I do not think this is very helpful as to what Mr. Cray told him about his own success or failure in making inks. That is all hearsay. What are we trying to prove?

Mr. Byerly: I am inclined to agree with that. The problem that Mr. Cray put up to the witness is all I wish to bring out. I think that is plainly admissible.

Mr. Free: So may we have that answer stricken?

The Court: Strike that last answer out.

Q. In 1930 when Mr. Cray put this problem up to you what knowledge did you have of printing? A. I was engaged in the manufacture of pigments from the year 1910 on. Now our customers, customers for pigments were either paint manufacturers or printing ink manufacturers. In order to sell pigments to printing ink manufacturers naturally I had to have some idea about making printing inks on a laboratory scale, and I have made many, many myself all these years on a laboratory (158) scale.

Q. At that time also I suppose you had seen printing presses running? A. Oh, yes.

Q. And you knew generally what a printing press was? A. Yes, I did.

Q. Did you know what the ordinary printing ink used on printing presses was made of? A. Yes. The printing inks at that time were mostly made—most of them—of drying oil, vegetable drying oils like linseed oil, perilla oil and chinawood oil and similar vegetable oil products.

Q. How do such oils and the inks containing them dry? A. They dry by oxidation.

Q. And how long a process is that? A. It goes from hours—the drying takes from hours to days. It all depends

if the sheet where the ink is printed upon is exposed freely to the air or if other sheets are piled on top of it.

Q. Now when you were asked to get them an odorless ink did you try to make up an ink out of these usual drying oils? A. No, because I knew that these drying vegetable oils took on a great deal of odor during the drying period and that it would never be possible to make an odorless ink out of a vegetable oil.

Q. What did you adopt as the vehicle for an odorless (159) ink in your work? A. It happened that at that period I was engaged in making a great many dispersed pigments and I had a good understanding of solvents and of lacquers, and I knew that in order to make an odorless ink it could not be done by drying oil but it would have to be done by a solution of an odorless binder in a solvent.

Q. By dissolving a binder in a solvent could you make something thick like linseed oil, that is, similar consistency? A. Oh yes, yes. By dissolving resins, natural or synthetic resins or cellulose products, like nitrocellulose, in a binder a great deal of viscosity is attained that way and heavy-bodied solutions are the result, looking very much like bodied linseed oil varnishes.

Q. Now did you keep a notebook of your work when you were with Zinsser & Company? A. I did.

Q. Can you recognize this notebook which I now hand you (handing to witness)? A. Yes, I do.

Q. What is that book? A. I do recognize it. It is a record of my laboratory experiments that I made during that period.

Q. Does the book contain dates when you did the work? A. Oh yes, it does.

Q. How in general are the notes on the various experiments arranged in your book? A. They are arranged (160) in a series by numbers and each large major series is arranged by a number and the subdivisions are arranged by the alphabet, A, B, C, D, E, F and so on, and again subdivisions of that.

Mr. Free: Your Honor, it sounds like we are getting into date of invention, which is premature. That is for rebuttal. We have not attacked the validity of the patent yet or its date of invention.

The Court: What is the probative value of this, Mr. Byerly?

Mr. Byerly: I think, your Honor, that while unquestionably it bears on the validity of the invention that in this case Mr. Free has raised the question of infringement, apparently, as his principal defense and has put forward the argument that there is no infringement because the claims are broader than what Dr. Gessler invented. Now while it is impossible to keep that defense entirely separate from the defense of invalidity I feel that the best way to answer that is rather not by argument but by bringing before your Honor at this time all the facts relative to the making of this invention and the development of it. I think that will give a clearer understanding of what the patent teaches and will enable you to pass on the question of infringement.

(161) The Court: Well, he has not attacked your patent yet.

Mr. Free: No.

The Court: Until he does it is not necessary for you to defend it.

Mr. Byerly: I think in a way he has attacked——

The Court: He has indicated he will.

Mr. Byerly: He has indicated that he will attack it, that he intends to attack it. That is about as far as he has gone.

The Court: You cannot anticipate his case by putting your defense on ahead of it. So I think this is immaterial and I will sustain the objection for the present.

Mr. Byerly: Then I will limit the examination of this witness at this time, your Honor, to a few

points which I think perhaps bear more directly on the question of infringement.

Q. Dr. Gessler, you are the inventor named in the patent in suit, are you not? A. I am.

Q. Since you have been with the Interchemical Corporation that company has sold quick-drying inks commercially, have they not? A. Oh yes, they have.

Q. The specific ink given as an example in your patent contained butyl carbitol as a solvent, did it (162) not? A. Yes, it does.

Q. Taking these heat set inks which the plaintiff is selling commercially at the present time do they all contain the same identical solvent as that named in your patent? A. No, with a restriction, that they are not chemically the same but the physical qualities are very similar.

Q. Is there any resemblance between the vapor pressure of the solvents used in these inks and the vapor pressure of butyl carbitol? A. Yes, they are very similar.

Q. Can you point out in what respects there is a similarity? A. The vapor pressure of butyl carbitol and the vapor pressure of these solvents we are talking about now, mainly petroleum solvents, are characterized by three qualities.

The first is that the vapor pressure at ordinary temperature, at room temperature is so low that it does not evaporate on the rollers of a printing press. It has been found that butyl carbitol possesses a vapor pressure low enough to do that. So if a solvent has a vapor pressure as low as butyl carbitol it is quite certain that it will not evaporate on the rollers of a printing press.

The second quality of the vapor pressure characteristics of butyl carbitol is that upon rise of (163) temperature, particularly above 100 degrees Centigrade, which is the boiling point of water, the vapor pressure rises very, very fast and it rises so fast that it rises to a good thousand-fold

as it was at the temperature of 20 degrees, which is room temperature.

The third vapor pressure characteristic of butyl carbitol is that since it is a chemical compound and therefore has a very narrow boiling range, that if it is exposed to high temperature it will evaporate at a constant rate from beginning to end.

Those are the three outstanding vapor pressure characteristics of butyl carbitol, and those are the three outstanding vapor pressure characteristics of the petroleum solvents that are used in these fast-drying inks.

Q. Now in regard to the second characteristic which you mentioned, that is, the rapid rise in vapor pressure up to a thousand-fold over what it was at room temperature, to what order of vapor pressure does butyl carbitol rise when heated above 100 degrees? A. In order to explain that I would like first to explain the yardstick by which it is measured. It is measured in the metric system. So that in order that we all understand the metric system, perhaps you will permit me to say a word about it. The unit of the metric system is a meter, which is a little bit longer (164) than a yard. A meter is divided into 100 equal parts and that makes centimeters. A centimeter is divided into 10 parts and that makes a millimeter. The next smaller measure is a thousandth of a millimeter, which is called a micron.

The vapor pressure of butyl carbitol at 20 degrees Centigrade, which is room temperature, is of the order of 20 microns. The vapor pressure of butyl carbitol at raised temperature, say, at 150 degrees Centigrade, is in the level, now, of centimeters. It is something like 6 centimeters, which is more than a thousand times what it was at 20 degrees. While the temperature has only risen from 20 degrees to 150 degrees, the vapor pressure has increased a thousand-fold.

Q. As to these petroleum solvents used in the inks which the plaintiff is selling now, is there any vapor pressure such

that at 150 degrees Centigrade it is of the order of centimeters? A. Yes, they are all of the order of centimeters.

Q. You have mentioned three characteristics of the vapor pressure of butyl carbitol, do you know of any solvents which have these three vapor pressure characteristics, which may not be substituted for butyl carbitol in the specific ink described in your patent, and produce a satisfactory ink?

(165) Mr. Free: We are trying to follow the patent here. The patent mentions only one solvent, butyl carbitol, and he is asked now to name some more.

The Court: He names that merely as an illustration.

Mr. Byerly: That is right.

Q. (Read.) A. Yes, I do. The patent names one other quality that solvents of that nature must possess, and that is that they must form a stable solution with a binder that is dissolved in it. That is very essential. It happens that there are solvents which form non-stable solutions, solvents that have the same vapor pressure characteristics as butyl carbitol, but, however, form non-stable solutions with binders. An example of that is, for instance, a solvent called diethylene glycol. The reason that this solution is not stable is that this solvent is hygroscopic. That means that it attracts very readily the moisture that is contained in air and thereby constantly becomes larger in volume, or diluted with water. If, now, a solution of the binder, let me say nitrocellulose or a synthetic resin, is made in diethylene glycol, and it is exposed to air as it would be in a very thin film with a tremendously large surface on the rollers of a printing press, it would attract so (166) much water during that comparatively short time, so much moisture out of the air, that the binder that is dissolved in that solvent would not remain in solution but would commence to precipitate out because the solvent has been diluted with water.

Q. Now, Dr. Gessler, do you know of any solvents which have, I think, the four characteristics which you have now mentioned, that is, the three characteristics of the vapor pressure of butyl carbitol and also the ability to make a stable solution with a particular resin binder, which is to be used in an ink, which could not be substituted for butyl carbitol in the ink described in your patent? A. I do not think I got the question.

Q. (Read.) A. I do not know such solvents.

The Court: Is butyl carbitol used in all commercial inks?

The Witness: Well, butyl carbitol and materials —I do not think I got the question fully yet.

Q. I think perhaps the question was not clear when it was read. Supposing I say it again. You have referred to three vapor pressure characteristics of butyl carbitol; you have also stated that in order to be satisfactory in your ink the solvent which is used must dissolve the ink binder and form a stable solution? (167) A. That is right.

Q. Now, I am asking you whether you know of any solvent which has these three vapor pressure characteristics of butyl carbitol, which you have mentioned, and which also has the characteristic of forming a stable solution with the ink binder, and which could not be substituted for butyl carbitol in the ink of your patent? A. If a solvent has the three vapor pressure characteristics of butyl carbitol, and if the solvent forms stable solutions with the binder—that means, now, we are not concerned with the chemical composition of the solvent at all, we are talking about physical properties of the solvent. Is the question do I know other solvents than butyl carbitol, or what is the question?

Q. Perhaps I have not made it clear. You have said that the petroleum solvents, for instance, which are used in commercial inks by the plaintiff have these physical characteristics, the four similarities to butyl carbitol in the

matter of vapor pressure and the ability to hold the resin in solution, that is correct? A. That is correct.

Q. And what I am trying to bring out is whether those four physical characteristics are sufficient to indicate that a solvent is stable for use in your ink?

(168) Mr. Free: The questions are very leading. I think if we are getting a point here in infringement, let us have the witness testify.

The Court: The objection is sustained.

A. Solvents that have these four characteristics and, for instance, possess a very strong odor, could not be used in place of butyl carbitol.

The Court: What you want to know is whether there is any other solvent than the one, butyl carbitol, that has these four characteristics?

Mr. Byerly: No, if your Honor pleases, what I am trying to ask the witness, and perhaps I have not made it plain to him—he has named these four physical characteristics of butyl carbitol, which also apply to the hydrocarbon solvents which are being used commercially instead of butyl carbitol, and all I am asking him is whether these four physical characteristics form a criterion for determining whether a particular liquid will make a satisfactory solvent in his ink. If that is not a proper question I withdraw it, but that is the substance of the question.

The Court: It is proper, but you do not make it clear either to the Court or to the witness.

The Witness: It is not clear to me. I admit.

The Court: Perhaps you can break it up in some (169) way.

Q. I will try breaking it up, as the Court suggests, and I think perhaps that may make it a little clearer. Is any part of the work which you have done in connection with

this heat-drying ink, indicative that it is necessary that the solvent should have a vapor pressure as low as the vapor pressure of butyl carbitol at ordinary room temperature?

Mr. Free: We have been all over that before, it seems to me. The same question was asked and answered before.

The Court: I do not recall it.

Mr. Byerly: I do not think it was, Mr. Free.

The Court: I will let him answer it again.

A. A solvent to be usable for this class of thing must have a vapor pressure as low as that of butyl carbitol.

Q. When did you ascertain that, Dr. Gessler? A. When did I what?

Q. When did you find that out? A. In the year 1930.

Q. You said that another characteristic of butyl carbitol's vapor pressure is that when you heat it to above 100 degrees Centigrade—say to 150, its vapor pressure is of the order of centimeters? A. That is correct.

(170) Q. Did any of your work indicate that this was a necessary characteristic of the solvent which is to be substituted for butyl carbitol? A. Yes, it did.

Q. Your patent mentions, does it, a substance known as dibutylphthalate? A. It does.

Q. And it refers to that substance as a plasticizer and not as a substitute for butyl carbitol? A. It does.

Q. I show you Exhibit 5, will you point out anything there which bears on the question of what order the vapor pressure should have at 150 degrees in order that the solvent may be successfully used in place of butyl carbitol? A. It should be of the order of centimeters at 150 degrees Centigrade.

Q. What is the order of the vapor pressure of the substance dibutylphthalate, which is also referred to in your patent, but merely as a plasticizer and not as a drying solvent? A. It is about a tenth of a centimeter.

Q. So that could not be used to replace butyl carbitol? A. No, because it is not up to the level of centimeters in its vapor pressure at 150 degrees Centigrade.

Q. You have already pointed out another characteristic of the vapor pressure of butyl carbitol is the uniformness of its vapor pressure while it is evaporating. A. That is correct.

(171) Q. Is that characteristic required in a solvent in your ink? A. Yes, it is.

Q. And you have also pointed out that if an attempt is made to use in your ink the solvents which will not make a stable solution with the binder, that they are unsuccessful, the solvents cannot be— A. It is unsuccessful.

Q. Would the ink be stable on the press if the solvents did not hold the binder in a stable solution? A. No, it would not.

Mr. Byerly: Of course I should like to illustrate some of this by going into this witness's early work in developing the invention, but in deference to your Honor's ruling I will hold that for rebuttal.

That is all.

Cross examination by Mr. Free:

Q. Do I understand you correctly to say that diethylene glycol would not be a suitable solvent for an ink of the heat-set type? A. It would not for most of the binders used.

Q. What is its vapor pressure at 150 degrees? A. I would say it is similar to that of butyl carbitol.

Q. Except for its great affinity for water, it would otherwise be a good substitute for butyl carbitol, would it not? A. I do not know if it would be a good substitute.

Q. But it is in that same class? A. I really have (172) never made a fast-drying ink with diethylene glycol.

Q. But its principal difficulty is its great affinity for water? A. Yes, it is therefore used for water-setting inks

that are set and dried by the addition of small quantities of water in the form of mist spray.

Q. I have here a set of curves, marked Defendant's Exhibit A for identification, which has on it a curve for diethylene glycol, will you please check me to see whether I am reading the vapor pressure accurately at 150 degrees Centigrade? I make it about 24 millimeters, or 2½ centimeters, is that about right? A. Yes, that is about correct.

Q. Do you remember, Dr. Gessler, your experiences with butyl carbitol inks in the early days? A. Yes, I do.

Q. Particularly with the difficulty of drying out the ink rolls? A. Yes.

Mr. Byerly: I should like to object to this, your Honor. Your Honor has excluded me going into this witness's early work and placing the whole history of it before you, and now he is to be cross-examined as to that, which I think is entirely irrelevant to the direct and is an attempt to put in the cross examination before the direct examination.

(173) Mr. Free: This is after the patent issued. This is the inks that were tried down in the Curtis Publishing Company in 1933 that I am asking about.

Q. (Read.)

Mr. Byerly: That relates to the time long before the patent issued.

Mr. Free: No, your Honor, this has to do with the testimony that we had out of Mr. Cray yesterday about the difficulties of the Curtis Publishing Company.

The Court: Try to tie it up into that, and I think it will be all right. Your question is general. Reframe your question.

Mr. Byerly: I should like, if this is to be gone into, to have the privilege of asking some direct questions, to bring out in sequence the matters which your Honor allowed to be put in through Mr. Cray, as to the development of this witness's ink at Curtis and elsewhere.

The Court: You can ask those later. Withdraw your question and tie it right into the Curtis situation.

(174) Mr. Free: Yes.

Q. Dr. Gessler, you recall, do you not, the experience you had at the Curtis Publishing Company with your butyl carbitol ink tests? A. Yes, I do.

Q. And at that time there was considerable difficulty owing to the drying out of the glue glycerin rollers? A. There was difficulty.

Q. And that difficulty is due to what? A. That difficulty is due to extracting some water out of the rollers. I would like to go into that—you made the statement yesterday which was not——

The Court: Never mind. Just answer the question.

Q. Answer the question and then stop. A. All right.

Q. I will ask the next question. That was due to the affinity that butyl carbitol has for the water in the ink rollers, was it not? A. That was due to——

The Court: Can't you answer yes or no?

The Witness: Yes.

Q. And because it had a great affinity for water the butyl carbitol sucked the water out of the ink roller, is that right? A. It did not suck it out. Water is soluble in butyl carbitol, but that does not mean any sucking effect, does it?

Q. Well, let us put it this way: the water passed (175) from the ink roller into the butyl carbitol of the ink, did it not? A. Yes.

Q. Now, Dr. Gessler, I would like to read to you a passage from one of your later patents, No. 2,128,672, issued August 30, 1938——

Mr. Free: A copy of which I offer in evidence as Defendant's Exhibit C.

Mr. Byerly: I object to that, your Honor, as immaterial, a later patent. It has no bearing on the patent in suit, and cannot possibly be an anticipation.

Mr. Free: I will connect it up with the patent in suit.

The Court: With that understanding, go ahead.

(Marked Defendant's Exhibit C.)

Q. You do not have a copy, do you, Dr. Gessler? A. I have it in my brief case.

Q. Well take this one (handing to witness). A. Thank you.

Q. Now referring to Defendant's Exhibit C, your patent, in the very first two lines it refers to the patent in suit here, does it not, which is No. 2,087,190? A. It does.

Q. And then it goes on, in that first paragraph, to describe the properties of that ink, does it not? A. Yes sir.

(176) Q. And it states that the ink contains diethylene glycol monobutyl ether, which we have been calling butyl carbitol here, does it not? A. No, it does not.

Q. That is in lines 13 and 14, the first column on page 1. A. Well, but it speaks about solvents which possess physical properties like those characteristics of diethylene glycol monobutyl ether.

Q. It does mention butyl carbitol, doesn't it? A. It mentions it as an example, yes.

Q. Then I would like to read this to you, beginning at line 54 of the first column on page 1:

"Many printing presses, and especially those used for fine printing, are equipped with a very sensitive type of ink-distributing rollers, carrying the ink from the fountain to the printing plates and consisting generally of mixtures of glue, glycerine and water or similar materials. If these rollers are used with the printing ink of my said co-pending application, they"——

Now that refers to the patent here in suit, does it not? A. Yes.

Q. Which mentions butyl carbitol; is that right? A. That is right.

Q. "they"—that is these rollers—"are subject to deterioration by reason of the tendency (177) of the ink to extract some of their constituent substances. This is explained by the fact that the solvents used in the preparation of the ink are miscible with water and/or glycerine or glycerine substitutes, and during their use with such ink-distributing rollers a slow extraction or exchange of these substances from the roller material takes place and the rollers eventually are rendered hard and inelastic and unable to carry and distribute the ink evenly and satisfactorily over the printing plates."

Now that is predicated on what you learned at Curtis and elsewhere, is it not? A. That is correct.

Q. And as we said before, the difficulty that you experienced there was due to the extraction of the moisture from the rollers by the butyl carbitol; is that right? A. That is correct.

Q. Now is diethylene glycol any more or less characteristic in its affinity for water than butyl carbitol? A. It is much more. It has a much greater affinity for water, in that it is hygroscopic. That means it extracts water out of the air at a very fast rate. Butyl carbitol does not do that.

Q. Butyl carbitol does, but not at the same rate? A. That is right; in a very very much smaller rate.

(178) Q. So that your principal objection to diethylene glycol is that it is hygroscopic?

The Court: What does that mean?

Mr. Free: Hygroscopic means extracting water, sucking it out of the air, or whatever it happened to be in contact with.

The Court: Absorbing water?

The Witness: Absorbing water; yes.

Q. And this patent, just to characterize it, Defendant's Exhibit C, was for the purpose of correcting the difficulty that you had with butyl carbitol in that respect, was it not? A. In the respect to glue-glycerine rollers.

Q. That is why you say down here in line 27 of the second column:

> "With ink-bearing rollers of this type, therefore, I have found it advantageous to use an ink which will not extract substances from them, particularly water, glycerine, or its substitutes."

Is that right? A. That is right.

Q. And then you propose the substitution in this patent of butyl carbitol acetate? A. I do.

Q. For butyl carbitol? A. I do.

The Court: Do you mean that butyl carbitol absorbs water from the inks and the presses?

(179) The Witness: No. May I explain that, your Honor.

The Court: Yes.

The Witness: There are a number of different materials from which the rollers, the distribution rollers of a printing press, can be made. They can be made from rubber, or they can be made from a number of synthetic substances, or they can be made of a mixture of glue and glycerine and water, which makes a very rubber-like substance. It happens that when

butyl carbitol goes or streams over these rollers all day long—and it must be for a long time—that some of the water which is contained in these glue-glycerine-water rollers dissolves in the butyl carbitol of the ink, extremely little at a time, but as it goes on for hours and hours and as it streams over the rollers a little bit of water, infinitesimal at the time, is always dissolved, and finally, after many hours or days, the rollers become hard on the surface and start to crack in little microscopic cracks. That is what is called cracking of rollers.

Q. So that we have—

The Witness: May I say something else, your Honor?

The Court: Yes.

The Witness: Rubber rollers, which were used (180) at that time, also contain no water, and therefore butyl carbitol is not able to extract water out of rubber rollers and therefore does not affect them.

Q. See if you will agree with this general statement, then, Dr. Gessler: that both butyl carbitol and diethylene glycol are hygroscopic, in the sense that they have a considerable affinity for water, but butyl carbitol is less so than diethylene glycol. A. It is very much less so. To that I agree.

Q. Referring again to your patent No. 2,128,672, which mentions butyl carbitol acetate, would you say that that substance has the four characteristics that you mentioned a while ago for printing ink of this type? A. Surely.

Q. And what is its vapor pressure at 150 degrees? A. It is of the order of centimeters.

Q. How many? A. Perhaps 2 or 3 centimeters. I do not recall it exactly, but it must be about 2 or 3 centimeters.

Q. Will you look at Plaintiff's Exhibit 5, and tell me (handing to witness). A. (Witness examines chart.)

Q. About 40, isn't it? A. It is about 4 centimeters.

Q. Forty millimeters, isn't it? A. Yes; 40 millimeters is 4 centimeters; that is correct.

Q. We were talking a while ago about high boiling (181) petroleum solvents that are used in place of butyl carbitol in the inks furnished by your company; do you remember that? A. Yes.

Q. I think you mentioned the vapor pressure at room temperature of these petroleum solvents, but I am not sure I heard you say what its vapor pressure is at 150 degrees Centigrade. A. They are of the order of centimeters.

Q. Give me a more exact answer. How many centimeters? A. Well the order of centimeters runs from 1 centimeter on up, does it not?

Q. Yes. You answer the question. I want to know from you how many centimeters the vapor pressure of these high boiling petroleum solvents are at 150 degrees Centigrade. A. I would say it is between 1 and 5.

Q. Your patent says that butyl carbitol has a vapor pressure at 150 degrees Centigrade of 60 millimeters or 6 centimeters? A. That is right.

Q. Do these high boiling petroleum fractions that you use in your inks have the same vapor pressure at 150, namely, 6 centimeters? A. No. They do not have exactly the same. They have a vapor pressure of the same level.

Q. I want to get an idea how close they are. Is it 50 centimeters, or 40 centimeters; or 30? A. No, no. I said before it was between 1 and 5 centimeters, so it (182) couldn't be 30.

Q. I am talking about millimeters, 50 millimeters. A. I beg your pardon.

Q. We are using the same term as in the patent? A. Yes.

Q. Let us be consistent. Let us talk about millimeters from now on, shall we? A. Yes.

Q. Then tell me what the vapor pressure of these petroleum solvents that you are now using in your inks is at 150 degrees Centigrade, in millimeters? A. It is between 10 and 50 millimeters.

Q. Can't you give it to me any closer than that? A. It all depends which solvent your refer to.

Q. Take one of the solvents that you use, and give me the vapor pressure of it at 150. A. May I see the chart and give you the vapor pressure of this 502-C solvent? Will that be satisfactory?

Q. I am asking you about your solvents, not the defendant's solvent. A. We have solvents that have vapor pressures of 2 and 3 and 4 centimeters, I would say.

Q. 2 and 3 and 4? A. Yes—even 5.

Q. That means 20 or 30 or 40 millimeters. A. Even 50. It would depend for what speed of a press it is designed.

Q. Do you have any inks now on the market that contain (183) a petroleum solvent having a vapor pressure of 60 millimeters at 150 degrees Centigrade? A. I don't know. I really don't.

Q. You are director of research of Interchemical Corporation, are you not? A. I am.

Q. And you do not know that? A. No, I am not in the manufacturing end. I haven't worked on that for the last five years.

Q. So that as near as you can tell me the vapor pressure of your petroleum solvent is somewhere between 20 and 50 millimeters at 150 degrees Centigrade; is that right? A. I would say so.

Q. Pretty wide range, isn't it? A. No. I think it is an extremely narrow range, when you consider the vapor pressure under 100 is a thousand times less, so that makes a very narrow range. You have to multiply by 1,000 in order to get to that range.

Q. Let us put it this way. Do the inks of 20 millimeter vapor pressure at 150 act the same as the vapor pressure—

A. I beg your pardon?

Q. Do the inks having a solvent vapor pressure of 20 milimeters at 150 act the same as those having vapor pressures of 50 millimeters? A. They dry a little bit slower.

Q. How much slower, on the same press? A. That is (184) regulated—let me see if I can answer you in this way. If a slower solvent is used the press will have to run slower, or more heat will have to be used in order to get the same degree.

Q. On the same press, with the same heat? A. Yes.

Q. The lower vapor pressure solvent dries much slower, doesn't it? A. It dries slower; that is correct.

Q. Now I think you said, Dr. Gessler, that your patent here in suit specifies that the solvent must have a narrow boiling range, did you not? A. I said——

Mr. Byerly: I object to that. I do not think the witness has tried to say what the patent states, your Honor. I certainly have not asked him.

Q. Well did you say that? A. I said that I compared all the solvents that are usable in inks of this character to butyl carbitol. Now it happened that butyl carbitol is a chemical compound and not a mixture. That means, to anyone who knows solvents, that it has a very narrow boiling range.

Q. Do you find any mention, anywhere in your patent, that the solvent must have a narrow boiling range? A. No, it must not be—no, I am sorry.

(Short recess.)

(185) Q. Going back to your visit at the Curtis plant, I think it was in 1933 or thereabouts. A. Yes.

Q. Do you remember a parallel printing operation which was conducted in the plant at that time? A. I do remember one distinctly.

Q. And that was with Levey's ink? A. Yes.

Q. And that ink contained a high boiling petroleum fraction? A. I believe it did, but we were not told.

Q. Did you ever have occasion to test it, the Levey ink? A. You mean then at that time?

Q. Yes. A. No.

Q. But you know, don't you, that Levey has been using high boiling fraction in their inks ever since 1933? A. I don't know. I know they use it now. I do not know what happened between 1933 and 1935, or 1934.

Q. When did you first find out that they were using the petroleum solvent in their ink? A. Let me go back to "what they were using". I saw an experiment. Whether they used it I have not the faintest idea. I only knew that much later, when I became associated with the Interchemical Corporation.

Q. That was in 1934? A. Yes, but then I did not know it either. It took another year or so before I knew it definitely.

Q. When did Interchemical change over to a high boiling (186) petroleum solvent for the largest proportion of its heat-set ink? A. I would say they started changing over from the year—the beginning of 1935 on. It might have been the end of 1934.

Q. That is close enough. A. Yes.

Q. Will you refer to the patent in suit. There is a reference there in the second column of page 2, line 28, to another application. The passage reads:

> "This method of printing is not claimed herein as it forms the subject matter of my co-pending application, Serial No. 15,944, filed April 12, 1935, which is in part a continuation of this application."

Do you find that there, Doctor? A. Yes.

Q. That application has been abandoned, has it not? A. It has been.

Q. And the method there described in that application was the method of printing with the ink which is shown in this patent, is that right? A. Yes, in the larger sense.

Q. Doctor, there too the method was passing the printed web underneath a heater, or in a heating zone, to touch off the solvent? A. If it was printed on both sides. That was an essential part.

Q. So that we understand it, this patent here in suit (187) has nothing to do with the method of printing? A. Yes, I understand.

Q. You said you had a good understanding of lacquers and solvents even way back when you were with the Zinsser Company? A. Yes.

Q. And you have made a practice ever since to keep in touch with new solvents that come out on the market? A. Fairly.

Q. You read the industrial journals and publications? A. Oh, yes, sir.

Q. And the advertisements of solvent manufacturers? A. Many of them.

Q. That is also true of new resins that come out from time to time? A. Yes.

Q. And pigments? A. And pigments.

Q. And whenever you can and the price permits, you use them in your inks, do you not? A. Oh, yes.

Re-direct examination by Mr. Byerly:

Q. Dr. Gessler, Mr. Cray has said that you furnished him with what he called varnishes containing butyl carbitol, which were made into inks and used by the Curtis Company, is that correct? A. That is correct. I also furnished him with pigments.

Q. With the pigments? A. That is right.

Q. Then in order to make what you supplied to him in (188) the ink, it was necessary that you combine the substances that you sent him? A. I sent him varnishes of

different bodies, similar to the bodies of the linseed oil varnishes that they were using.

Q. Were these varnishes all made of butyl carbitol and a binder? A. They were made of butyl carbitol and a binder, with some plasticizers in there. Yes, that is correct.

Q. And they had different degrees of thickness? A. Yes, the reason for that is, let us talk for instance about nitrocellulose. Nitrocellulose comes in many different degrees of viscosity. That means one nitrocellulose will dissolve in a given amount of solvent to a very thin solution. The same amount of nitrocellulose, but a different nitrocellulose, will dissolve to a very heavy body solution.

The Court: Does that mean in the same solvent?

The Witness: That means in the same solvent, only the nitrocellulose is different. There are very many different grades, and thereby the body of the varnish can be altered.

Q. And that enabled Mr. Cray to exercise his skill as an ink maker in determining the exact thickness he wanted his ink? A. Yes.

(189) Mr. Free: I object to that. We do not know that, do we? We do not know that Mr. Cray was able to use his skill to do that.

The Court: Qualify him as an expert. The objection is overruled.

A. Yes, he did, because he had a line of varnishes similar in body to the linseed oil varnishes that he was using beforehand.

Q. Did you personally go down to the Curtis Publishing Company and see these butyl carbitol inks printed on big presses, I mean, presses with rollers and webs? A. I did.

Q. Did you personally observe the ink on the ink rollers of these presses? A. No.

Q. Did you personally observe the drying of the ink? A. No, I observed that the ink did not dry on the ink rollers.

Q. Oh, you observed the ink rollers, but you did not see any drying, is that it? A. Perhaps I did not get your first question.

Q. You saw these presses in operation with your butyl carbitol ink? A. That is right.

Q. Did the ink dry on the inking rollers of the presses? A. Oh, no, it did not. That was one of the main points.

Q. You personally ascertained that it did not by (190) looking at it? A. Oh, yes, looked at it and felt it.

Q. Did you make any similar personal observations on the condition of the ink after it had been printed and passed through the heater? A. Yes, I saw it and felt it.

Q. Did it dry? A. It dried.

Q. Did you receive any complaints from the Curtis Company as to the inks drying on the ink rollers or failing to dry when they went through the heater? A. No, there was no complaints.

Q. Was there any complaint from Curtis on any other point? A. Yes, there were complaints that the rollers started to dry after long runs with these inks. They were glue-glycerine rollers.

The Court: After a long run?

The Witness: After a long run. It takes hours and hours to get these effects of these microscopic cracks on the surface of these sensitive rollers.

Q. These cracks, as I understand it, are something that you cannot see with the naked eye but have to see with a microscope? A. That is correct. They are very, very small.

By the Court:

Q. What harm do they do, make a rough surface? A. Yes, they fill up with ink and they start to print very fine

(191) hairlines over the paper, but they are never large cracks; they are microscopic almost in size.

Q. Those are just the rollers that transfer the ink alone? A. Yes, and they had these glue-glycerine rollers in the place where they transfer the ink to the printing plate.

Q. Because of this double motion effect I should think those little cracks would show? A. It is only if the rollers that contact the printing plate itself are glue-glycerine. They do not move sidewise.

Q. The rollers that did do not move sidewise? A. No, not the rollers.

Q. The one just receiving that? A. They all move sidewise.

Q. They put the ink on the last roller? A. Yes.

Q. Doesn't that move sidewise? A. Yes.

Q. Then there would not be any crack on the last roller? A. May I point out here? (Indicating.)

Mr. Byerly: This is Exhibit 14.

A. (Continuing) This is the printing cylinder where the plates are fastened to the cylinder. It is these rollers here. There are four, 1, 2, 3 and 4, that contact this printing cylinder. If these rollers should be cracked they would, after a long run, show fine hairlines in the printing on the paper. With all the other rollers (192) it would not matter.

Q. Those last four do not have the side motion then? A. No.

Q. They do not move on their axis? A. They can turn around their axis.

The Court: I thought there was a lateral motion.

Mr. Byerly: They do not have the endwise motion.

The Witness: They do not have the endwise motion, the last four.

By Mr. Byerly:

Q. Did you take any steps to meet these complaints, Doctor? A. Yes, I did.

Q. What did you do? A. I looked for a solvent that had the same characteristics as butyl carbitol, but would not affect the glue-glycerine rollers.

Q. Did you find such a solvent? A. I did not find it in the market. The way I found it was that I spent a few days at the Mellon Institute at Pittsburgh, and we went over all the new solvents that the Mellon Institute had worked out, so we are not talking about commercial solvents. We are talking about laboratory samples. And going over very many and specifying the characteristics the solvent must have, we found one that I took home with me and found it to work.

The Court: You found it worked?

(193) The Witness: Yes, I found it worked.

Q. And that, as you have said, was the solvent butyl carbitol acetate? A. That is butyl carbitol acetate.

Q. Now, you have been asked about seeing another ink run on the same press as your ink, when you were down at Curtis one time? A. Yes, I saw that.

Q. Did you write out and sign a memorandum of what you saw on that trip to the Curtis Company? A. I did, I remember it distinctly.

The Court: When you found this butyl carbitol acetate, that was a better solvent than butyl carbitol?

The Witness: It was not better. It just had the qualities that it did not crack the rollers any more.

The Court: You adopted that then for your ink and gave up butyl carbitol?

The Witness: Yes, to a large extent. May I explain? At that time I experimented mainly with

the Curtis Company and with the experiments with them butyl carbitol was replaced by butyl carbitol acetate.

Q. The Curtis Company was not the only one to which inks with your varnishes were being supplied at that time? A. No, the Manufacturers Printing Ink were also supplied with printing ink of this nature by me.

Q. Did those contain butyl carbitol or butyl carbitol acetate? A. Both.

(194) The Court: Since that time then have you used the acetate instead of the other?

The Witness: We used the acetate where glue-glycerine rollers were used. It happened that the experiments that the Manufacturers Printing Ink were making were used on presses which had rubber rollers, and no cracking occurred on those rollers.

Q. You said you made a memorandum of your observations when you saw the Levey ink run on the same press as your ink? A. I did.

Q. Can you recognize the paper which I now show you (handing to witness)? A. Yes, I do. It is signed by myself.

Q. Will you refresh your recollection from that and tell us both the date at which you saw your ink and the Levey ink running on the same press at Curtis, and also what you observed? A. It says here, "Report on test. Runs at the Curtis Publishing Company in Philadelphia."

Mr. Free: That speaks for itself, doesn't it?

The Court: He is asking him to read it.

Mr. Byerly: I asked him to refresh his recollection. I suppose it is a technical matter, whether he reads it out loud or reads it to himself and then states the substance.

The Court: Are you going to offer it in evidence?

(195) Mr. Byerly: I thought I would show it to counsel on the other side, but I think it might be more proper to refresh his recollection.

The Court: Have you any objection?

Mr. Free: No, but I would rather not have him read it.

The Witness: This refers to runs made from February 9 to February 22, 1934. The report was signed by me on February 26, 1934.

Q. Now, will you read it through and refresh your recollection, and then tell us what you observed at that time in February, 1934, at the Curtis Company? A. I observed that the Curtis officials had pronounced the rollers to be unaffected and as good as new after 560,000 pages were printed. The Curtis Company also pronounced that the drying was instantaneous.

The Court: What is this, with butyl carbitol acetate or the other?

The Witness: I think this is butyl carbitol acetate ink. That is correct.

Mr. Free: You do not remember, do you, Doctor?

The Witness: It gives the composition of the ink at the top, and it uses a varnish 107C4, and I am quite certain that is a butyl carbitol acetate ink.

The Court: How many pages was that, how long (196) a run?

The Witness: 560,000. It further says that an examination of the rollers after the press had been stopped for almost an hour by Dr. Gessler and Mr. Cray, showed that no drying of the thin ink film on the rollers had taken place.

Q. What did you observe as to this Levey ink that you saw being run on the same printing press? A. I noticed that there were eight pages printed side by side on this press. Four of these pages were on the lefthand side and

were printed with our ink. The four pages on the right-hand side, all in one row streaming off the press, were printed by another ink, which we understood and were told was an ink by Levey. I would like to read a few sentences out of my report. I noticed that the prints of this Levey ink on the paper were not as dry as the prints of our inks. They were not fully dry, and I also noticed that while we examined the rollers on the press after about an hour's stop, that the Levey ink had almost completely dried on the rollers while ours was as wet as ever.

Q. You have already said, I think, that you ascertained or guessed that this was an ink with a petroleum solvent, did you not? A. Yes.

The Court: The Levey ink was not as dry as your (197) ink?

The Witness: On the paper.

The Court: But on the roller it was dry?

The Witness: It was dry, that is correct.

Q. Did your observations of these two inks running on a press with a heating unit enable you to make any comparison between the vapor pressure of the solvent in your ink and that used in the other ink? A. Yes, I think that was quite evident, and the conclusion of it was quite evident, and that is that the ink must have contained solvents which evaporated much faster than our solvent did. That is why they dried on the rollers. It must also have contained solvents that dried much slower than the solvent in our ink. That is why it did not dry on the paper. So I concluded that this was a mixture, a very wide cut of petroleum solvents.

Q. You saw both your butyl carbitol inks and your butyl carbitol acetate inks run at the Curtis plant, did you not? A. I did.

Q. What if any difference did you observe in the condition of the two inks on the rollers of the press? A. The rollers that were used for printing the butyl carbitol acetate

inks were in perfect condition after 560,000 pages had been printed, and were pronounced by the Curtis Publishing Company to be perfect and not (198) affected, while in previous experiments—in reality I had never seen the rollers after a run. It was always so that when I was in Philadelphia to watch a run, that after the next day the Curtis Publishing Company called up and informed Mr. Cray over the telephone that the rollers had cracked and showed signs of——

Mr. Free: I object to that as hearsay.
The Court: Strike it out.

Q. Did you observe any difference in your ink made with butyl carbitol and your ink made with butyl carbitol acetate, in the matter of the stability of the ink on the inking rollers? A. No.

By the Court:

Q. Was it true then that the acetate solvent corrected all the faults that had been found in the butyl carbitol? A. That is correct.

Q. On glue rollers? A. On glue-glycerine rollers.

Q. You had no problem on the rubber rollers? A. Had no problem at all.

Q. Did they use rubber rollers at the Curtis plant? A. No, they used rubber rollers at the plant where the Manufacturers Printing Company applied these inks.

Q. Over here in Passaic or Paterson? A. No, they made later on larger runs at Kalamazoo, with the Parchment (199) Company in Kalamazoo.

By Mr. Byerly:

Q. In the matter of the stability of the ink on the ink rollers and the drying of the ink on the paper, did you observe any difference between the butyl carbitol ink and

the butyl carbitol acetate ink when you saw these tests in Philadelphia? A. No.

Q. In discussing diethylene glycol in connection with ink, you said it was hygroscopic, is that correct? A. That is correct.

Q. If such a substance, diethylene glycol has a resin dissolved in it and is exposed to the air, what happens? A. The solvent will absorb water out of the air, therefore becomes diluted with water, and will not be able to carry the resin in solution any more.

Q. Does that mean the resin would be precipitated? A. The resin will start to precipitate. That does not mean all of it will precipitate. It will start to precipitate as it absorbs water.

The Court: Will water attract water?

The Witness: It absorbs water from the air.

The Court: It already has water in it, hasn't it?

The Witness: No.

(200) Q. Does this precipitation of the solvent occur in your butyl carbitol ink when it is exposed to the air? A. No.

The Court: What is the difference between butyl carbitol and butyl carbitol acetate, I mean, in layman's language? What do you put into it?

The Witness: Butyl carbitol is compounded with acetic acid, and therefore loses a great deal of its solubility in water. It is still soluble in water, but not fully any more, only to a certain extent.

Q. Doctor, you have spoken of selling ink or furnishing your butyl carbitol ink to the Manufacturers Printing Ink Company. A. Yes.

Q. What was the individual in that company with whom you did business? A. It was Mr. Detrick, with whom I was friendly.

Q. Did you make any personal notes as to the inks or varnishes which you supplied to Mr. Detrick of Manufacturers? A. Yes.

Q. I show you a memorandum. Can you refresh your recollection from that and tell us what dates you supplied ink or varnish to Mr. Detrick, and whether it contained butyl carbitol or butyl carbitol acetate? A. This is a sheet that was written on May 3, 1932. It refers to varnishes that were made for Mr. Detrick, as it says here. (201) The varnish was called L varnish. It consisted of butyl carbitol and nitrocellulose, mainly. There was no butyl carbitol acetate in it.

Q. I show you another memorandum. Can you ascertain from this as to whether you sent any other of these varnishes to Mr. Detrick, and also whether they contained butyl carbitol or butyl carbitol acetate? A. Yes.

Q. What is the situation now? A. These are sheets written in the year 1932. They run from August 8 to November 5, 1932, and they refer to a number of samples, large and small, sent to Mr. Detrick.

Q. What solvent did those samples contain? A. They contained butyl carbitol, according to these sheets.

Q. I show you another memorandum. Does that enable you to refer to any other sales of varnish to Mr. Detrick? A. Yes, here is the sheet that runs from May 3 again to November 5, 1932, and it gives a long list of materials sent to the Manufacturers Printing Ink Company.

Q. Do those sales include butyl carbitol or butyl carbitol acetate? A. Butyl carbitol.

Mr. Byerly: That is all.

Re-cross examination by Mr. Free:

Q. I believe you said in answer to his Honor's question that the butyl carbitol acetate solved the roll cracking problem? A. Yes.

(202) Q. The reason I ask that is because in 1938 when you gave testimony in the litigation with Levey, you were asked this question:

> "Q. Did you ever succeed in solving the cracking of rollers when you used an ink having butyl carbitol in the composition? A. No."

A. You are talking now about butyl carbitol?

Q. Yes, the answer is no, you never did solve it. A. I did not solve it with Levey.

Q. And butyl carbitol acetate did solve it? A. It solved it with the Curtis Publishing Company, because it fitted their glue-glycerine rollers.

Q. So that the answer you gave in 1938 is still true, that is, you never succeeded in solving the roller cracking problem with butyl carbitol ink? A. On glue-glycerine rollers, that is correct.

Q. Now the cracking was not the only problem you had with glue-glycerine rollers when butyl carbitol ink was used, was it? A. I am not aware of any other at the moment.

Q. The reason I ask that question is because in your patent No. 2,128,672 you stated at line 14 of the second column that "the rollers eventually are rendered hard and inelastic and unable to carry and distribute the ink evenly and satisfactorily over the printing plates." (203) A. Well, that is all the same phenomena.

Q. That is, these glue-glycerine rollers are supposed to be soft? A. That is right.

Q. And they act something like a clothes wringer roller? A. That is correct.

Q. They distribute ink from one roller to another? A. That is correct.

Q. If they get hard they cannot do that? A. They do not carry so much.

Q. So it was not only the cracking that was the difficulty; it was the hardening as well, is that right? A. Yes. They are the same phenomena.

The Court: They would not crack until they got hard?

The Witness: That is right. The cracking is simply a symptom of hardening, is it not?

Q. So what you would get is no transfer of the ink from the fountain to the type? A. Less transfer.

Q. Not sufficiently even to do a good job? A. That is right.

Q. And the Curtis Publishing Company prints the Saturday Evening Post? A. They do.

Q. Ladies Home Journal? A. They do.

Q. All high class publications in your opinion? A. Yes, sir.

(204) Q. And that sort of printing with hard rollers would not do the work according to their requirements, is that right? A. That is right.

Q. You were satisfied, were you not, that Curtis Publishing Company had done everything it could to solve the problem before it discarded your ink? A. No, I was not.

Q. You thought they turned you out too soon? A. Certainly.

Q. This solvent which you refer to in the memorandum you had, referring to the Curtis situation, was all butyl carbitol acetate, was it not, that is, the two inks shown, 9816 and 9836? A. Yes, that is right.

Q. In the second one here shown you used 45 pounds of the ink and that, according to this report, showed signs of cracking the rollers after 70,000 impressions; do you remember that? A. I do.

Q. And that was butyl carbitol acetate, wasn't it? A. Yes. You see the difference between the two?

Q. What is the difference? A. The difference—may I explain that to you?

Q. Go right ahead. A. Butyl carbitol acetate is improved over butyl carbitol in that it is less soluble in water than butyl carbitol. It is not fully insoluble in water and

water is not fully insoluble in butyl (205) carbitol acetate. So for very long runs there still would be some water extracted out of these glue-glycerine rollers. I have found that the addition of 1/8th of one per cent of water and 1/8th of one per cent of glycerine to these inks gives a perfect balance that no water was fed into the roller and no water was fed from the roller into the ink. It arrived at a perfect balance. Now these two inks here, the one containing 1/8th of one per cent glycerine and 1/8th of one per cent water, as I recall, and the other one does not. That is the only difference. They are both butyl carbitol acetate inks.

Q. So under some conditions butyl carbitol acetate solves the cracking problem and under others it does not, is that right? A. It did.

Q. Did you ever make an ink with diethylene glycol as a solvent? A. I worked with diethylene glycol many times in my life.

Q. Did you ever make an ink with diethylene glycol as a solvent? A. That is right, yes.

Q. Did you happen to know that there is an ink on the market which uses diethylene glycol as a solvent? A. I do.

Q. Did you ever have any experience with that ink soaking up too much water from the air and becoming (206) unusable? A. I did, I did.

Q. That ink, however, is in commercial use currently in large quantities, isn't it? A. May I enlarge on that?

Q. Yes. A. You realize that the water contents or the moisture contents of air differ widely over the year; that is, in winter time a pressroom is about as dry as the desert of Sahara. In the summer time it contains 60 to 70, up to 90 per cent of humidity. Now if you print this ink, which is very sensitive to the moisture and water in a very dry pressroom in winter time there is no difficulty. If you attempt to print this ink in the summer time there is all the difficulty in the world and we would like to know how to solve that.

Q. Do you know of any pressroom which is bone dry in the winter time? A. Well, by bone dry I mean 20 per cent humidity, or something like that, yes.

Q. Have you ever noticed that in these large press plants they spray water in the air to keep the air moist? A. Some of them do.

Q. Curtis Publishing Company does. Did you notice that down there? A. No, I haven't been in Curtis ever since the year 1933—or more.

Q. And the reason they do keep the air moist is not on account of the ink but because the paper must not get too dry, isn't that so? A. That is so, but we are (207) not talking about large amounts of moisture in the air.

Q. So that your position is that in the humidified plants the diethylene glycol ink could not be used? A. If they fed too much vapor into the air they cannot use it, I maintain that.

Q. How about 40 per cent humidity? Is that too much? A. No, I think they might be stable at 40 per cent humidity.

Q. Most pressrooms are maintained at 40 per cent humidity, are they not? A. Not to my knowledge.

Q. You do not know anything about that? A. No. In the summer time they cannot possibly, unless they are air-conditioned. They do not contain the 40 per cent humidity; they contain 80 per cent.

Q. In the winter time they maintain at least a 40 per cent humidity, is that right? A. The ones that are air-conditioned.

Q. And those that spray water in the air; that is true, too, isn't it? A. Yes. May I say that the Curtis Publishing did not have an air-conditioned pressroom and water spray when I saw it.

Q. But you know that to be a familiar practice now? A. Yes, some pressrooms have it.

Q. The spray? A. That is right.

Q. Those runs that were made at Curtis on your ink (208) back in 1933 and 1934— A. Yes.

Q. —those were test runs, were they not? A. They were.

Q. And the Levey ink test was also a test run? A. So far as I know.

Q. Did you ever get any re-orders of ink from the Curtis Company after those runs? A. Certainly. That is why we kept on going.

Q. And then after about May 1934, I believe Mr. Cray said, you severed your relations? A. He severed his relations.

Q. Yes. A. That is correct.

Q. And that was because Curtis could no longer make your ink work? A. No.

Q. Is that right? A. No.

Q. You do not know what the facts are? A. No.

Q. They gave up the use of your ink? A. That is right.

Q. Now these rollers that are used on high-speed presses get pretty hot, don't they—the ink rollers? A. Yes.

Q. How hot? A. 30—may I enlarge on that?

Q. Yes. A. It might interest you that the glue-glycerine rollers will melt if they are heated above 35 degrees Centigrade. From that you can imagine how (209) hot these rollers got at Curtis.

Q. How hot do the rubber rollers get? A. Some of them get even hotter. They are not so sensitive.

Q. Say 40 or 50 degrees above room temperature, Fahrenheit? A. It might.

Q. That is because of the friction and the stickiness of the ink? A. In a long run.

Q. Yes. A. Oh yes, on account of friction.

Q. You mentioned Mr. Detrick. A. That is right.

Q. He is a relative of yours, isn't he? A. That is right —by marriage.

Mr. Free: That is all.

Mr. Byerly: That is all.

Mr. Byerly: I will call Mr. Detrick.

CALVIN DETRICK, called as a witness on behalf of the plaintiff, being duly sworn, testified as follows:

Mr. Byerly: If your Honor please, I find that the letters which this witness I think will need to refresh his recollection were very unfortunately not brought over this morning. I did not expect to get this far. It is near adjournment time. If your Honor would not mind adjourning now——

The Court: We will adjourn until two o'clock.

(209a) Mr. Byerly: May I ask your Honor, would it be possible to have a slightly longer adjournment? I have two witnesses who have come in from Chicago this morning. I haven't had a chance to speak to them. Would 2:30 inconvenience your Honor?

The Court: Not me, no.

Mr. Free: It is quite all right.

The Court: Then we will adjourn until 2:30.

(Recess to 2:30 p. m.)

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(210) AFTERNOON SESSION.

Mr. Byerly: I have a witness under subpoena, Mr. Hurley, who has just advised me that he has made all his plans for a trip that will take him away for about a month up in Canada. I will say frankly to your Honor that it is strictly rebuttal testimony. He ought to be here next week, but he is very anxious to avoid that, and if your Honor would take it now de bene esse——

The Court: Any objection?

Mr. Free: No, I would not ordinarily, but this puts off my case considerably more, and I have some witnesses coming from out of town too.

The Court: Is he a long witness?

Mr. Byerly: No, he won't be.

The Court: I will allow it, as an exception in this one case. He takes the place of Mr. Detrick, then?

Mr. Byerly: Yes. I will call Mr. Detrick as soon as he is through.

MARTIN J. HURLEY, called as a witness on behalf of the plaintiff, being duly sworn, testified as follows:

Direct examination by Mr. Byerly:

Q. Mr. Hurley, what is your occupation?

(211) The Court: It is understood that this is rebuttal testimony only?

Mr. Byerly: Yes.

A. Superintendent, Conde Nast Press.

Q. Where is that press located, Mr. Hurley? A. Greenwich, Connecticut.

Q. How long have you been engaged in the printing business? A. Oh, 30 years.

Q. Has some of your experience been in connection with rotary printing presses? A. Yes, a lot.

Q. Are you familiar with the press known as a rotary web perfecting press? A. Yes.

Q. Are you familiar with a sheet fed rotary press? A. I am.

Q. Would you explain to the Court. Describe those two sorts of presses to the Court? A. The difference between a sheet fed press and a web press is the sheets are single sheeted from a roll and then put into the press, both presses running from curved plates and printing on the same type of cylinders. A web press is where the paper will run right off the roll through the same curved cylinders. In our particular plant, and in the majority of plants, it comes out in folded signatures, meaning in 16-page booklets.

There are many types of sheet fed presses and rotary fed presses also. Rotary fed presses do deliver (212) flat sheets.

Q. But in these web presses, as I understand you, the paper goes through as a continuous web? A. That is right.

Q. And the so-called perfecting web press, in that there are two printing cylinders, and one prints on each side of the web? A. Yes.

Q. And in the sheet fed rotary press you have separate sheets of paper. How are they carried through the press? A. By rollers and grippers onto a delivery into the box in which they are delivered. It is on a string belt leaving the front end of the press.

Q. Sort of travelling tapes that pull the sheet along? A. It is a string delivery.

Q. Does that kind of a press print on one side or both sides? A. One side usually.

Q. When was your first experience with this web perfecting type of press? A. I would say 1916-1917.

Q. Whereabouts was that located? A. Southgate Press, in Boston.

Q. What kind of ink were you using at that press at that time? A. At that particular time the only ink I knew at least was just oil ink.

Q. That is just the ordinary linseed printing ink? A. Yes.

(213) Q. How long does linseed oil printing ink take to dry? A. It varies. I think some manufacturers have it now where it dries in eight hours. Many times, on larger sheets, it takes 24 hours to dry.

The Court: That is what you call oil ink?

The Witness: Oil ink. It depends on the size of the sheet. Where no oxidation can get into the paper it takes a much longer time for the sheet to dry. We happen to run a sheet 52 by 80, and it takes quite a long time in some cases to have our oil inks dry.

Q. In this web perfecting press where you used the oil inks some years ago, how were you able to print the second side of that web while the ink was still wet on the first side? A. It was necessary in that case to run what is known as a travelling tympan. It is usually a sheet of treated manila, and that passes between the inked side of the first printed side and the underneath sheet of paper, and in a case like that as a general rule much of the ink is absorbed off of the printed sheet, naturally, because it is being compressed. When you are making the second printing and it does not give you—well, you might say a full inking, as full of ink as you would like to carry—if you carry too much of it you will get a lot of smut and dirty sheets passing through into your box.

(214) Q. You referred to this travelling tympan. I wonder if you can explain that, how that works, by means of this diagram?

Mr. Byerly: I do not think the witness has seen the diagram.

A. It is what you call a travelling tympan. It is a sheet of manila the same size, sometimes a little larger than the sheet on which you are printing, and that must travel in between——

The Court: It cannot go through the press?

The Witness: Yes, it does. It travels through here. Here is your offset. Here is the offset roll. You have got a four-color plate here. The plates are on this cylinder here. The offset roll travels under that paper. Here is your paper coming down. In other words, this has the first impression. It prints here, prints the color plate then the black plate, and the printing on this side is on the top side. The wet side of the sheet faces the flat tympan, the flat impression cylinder.

The Court: This is the tympan here?

The Witness: This is the tympan here, and this travels underneath it, so when it takes an impression here it squeezes the sheet naturally to make a certain amount of pressure, and a certain amount of lick off (215) goes into this travelling tympan. When this is rewound you must take the roll away and put another roll in, and after a certain length of time, maybe the tenth time, the roll comes in a position where you will get the same roll you had here back in again, and in the meantime that ink has been dried up and absorbed so that it does not smut readily again.

The Court: This is the printed sheet?

The Witness: This is the printed sheet.

The Court: And here is the tympan here?

The Witness: That is right. The wet side of that sheet now, after it gets over here, is the bottom side, while the wet side over here is the top side. This is a two-color on one side and a four-color on the other. That is actually what that winds up to be.

Q. The number of colors does not affect the use of the tympan? A. No sir.

Mr. Byerly: I offer in evidence the diagram just explained by the witness.

(Marked Plaintiff's Exhibit 18.)

Q. As I understand you this tympan coming on to the wet ink on the first side picked off some of the ink? A. Well, it naturally does. If you take any particular wet sheet of paper and place it against another the other sheet is bound to lick off some, but this tympan is (216) treated in such a manner as to have a minimum— —

The Court: Is it dry?

The Witness: The tympan itself?

The Court: Yes.

The Witness: Yes, it is.

The Court: It would absorb moisture?

The Witness: As I say, it is treated to a certain extent to have the absorption at a minimum.

Q. But it actually does take ink off the printed sheet? A. When the volume of ink put on is too great. That is where the trick comes in.

Q. I see. So that in using this expediency it limits the amount of ink you can put on the printed sheet? A. That is right.

Q. With this arrangement with oil ink and web perfecting presses, and the tympan, could you get what is considered high quality printing? A. What is that again?

Q. (Read.) A. That is a kind of difficult question. It all depends on the quality that is necessary for the magazines being produced. I would say that you wouldn't get the quality that can be had by the use of the other type of ink.

The Court: What are the names of the publications that are printed by the Conde Nast Publications?

(217) The Witness: Well, our magazines are mostly oil inks, except the New Yorker and Field and Stream and several other magazines which we produce today. The quality has improved so vastly over what it was previously in the past, probably seven or eight years back. The majority of printers have gone to this type of printing rather than staying to the old-fashioned type.

Q. When you say "gone to this type of printing" you mean they adopted a different kind of ink? A. That is right.

Q. What is the name of the publication you get out on this web perfecting press with the oil inks—ten years ago did you say it was, or more than that? A. Oh, a long time before that, back in 1917; "Modern Priscilla".

Q. Now in your present plant out at Conde Nast you have both the sheet fed presses and the web perfecting type of press, do you not? A. That is right.

Q. What type of ink do you use on the sheet fed presses which print only one side of the sheet? A. Oil inks.

Q. How long after you have printed one side do you wait before you print the other side? A. As I said before, there is a variation; it all depends on the type of paper you are using, and the size of the sheet.

Q. Well is it a matter of hours or a matter of seconds? (218) A. No, no, it is hours; it isn't seconds at all. Eight hours is minimum, probably; 22 to 24 in some cases.

Q. What kind of ink do you use on your web perfecting presses that you have out at Conde Nast? A. All Vaporin.

The Court: Oil Vaporin or all Vaporin?

The Witness: All Vaporin.

Q. That is Vaporin ink? A. Yes.

Q. That is a brand of heat set ink, is it not? A. That is right.

Q. And from whom do you get that ink? A. International Printing Ink Company.

Q. When you are using that Vaporin ink on your web presses do you use this travelling tympan you have told us about? A. No sir.

Q. Do you use the kind of press with a heater which is shown in this diagram, Plaintiff's Exhibit 14 (indicating)? A. That is just about the same; Selas heater.

Q. And this is the type of web perfecting press that you use at Conde Nast? A. Yes.

Q. When did you first put in web perfecting presses out there? A. During the year 1937.

Q. Do you remember the circumstances under which you first bought rotary web perfecting presses at Conde Nast? A. Well there are several circumstances you might say. (219) Competition was one. Our customers wanting greater speed and volume in producing their magazines

on faster schedules, and having weekly publications where the distribution was so short and probably had to distribute most of the stuff within two or three days, why it became necessary to have a faster delivery and a faster printing job, plus maintaining the same quality which the customer insisted on.

Q. What particular weekly magazine were you printing at that time? A. The New Yorker magazine.

Q. And the publishers wanted that turned out faster; is that it? A. That is right.

Q. How many of these web perfecting presses did you buy for printing the New Yorker? A. Well, we did not buy all of them for printing the New Yorker. The New Yorker does not take all that we bought. We bought three.

Q. You bought three? A. Yes, sir.

Q. How much of an investment would that be? A. Oh, I would say half a million dollars.

Q. How does the printing quality that you get by using those web perfecting presses compare to what you got years ago when you used an oil ink on a web perfecting press? A. Well, I do not think there is any comparison in the old type of oil ink with the present Vaporin.

Q. In other words, you get high quality print if you (220) have the heat set ink? A. That is right. You can carry more full color and dry faster and have a cleaner job.

Q. Would you have bought web perfecting presses and made this big investment for printing the New Yorker, if you had to do the sort of work that you had previously done on web perfecting presses with oil inks? A. I doubt it very much.

Q. When did you first see a typographic printing ink that could be dried in a few seconds by heat? A. In 1936.

Q. Where did you see that? A. Why, I heard about it, and I had some member of the International Printing firm come to the plant and discuss it, and we saw the possibilities of it and were willing to share the expense in putting it in our own plant to experiment with, which we did.

Q. What kind of a press did you make these experiments on? A. We put it on a sheet fed rotary press in which we split the machine in the middle in order to get room to put the heaters in, at a cost of probably $5,000.

Q. Did those experiments convince you that the ink could be dried very rapidly by heating? A. It certainly did.

Q. By the way, both your sheet fed presses and your perfecting presses fed the ink to the rollers—I mean (221) fed the ink from the ink fountain to the printing cylinder through a long series of rollers, did they not? A. That is right, in order to break it down.

Q. Breaking it down I suppose means thinning it out, spreading it out? A. Makes it more printable, refines it.

Q. How long after you get the copy for The New Yorker do you have the plates running on your web perfecting press? A. The editors of course give us a closing date. That actually is not copy. That is after all revisions are made. We usually have plates on the press four hours afterwards. Our job is made ready about five hours later, and then we are under way; probably say nine hours.

Q. And how long is it before the edition is printed? A. The first edition—we have two editions. One edition is off in about ten hours, and the other edition probably takes us 14. They run a City and an out of town edition, you understand.

Q. How large are these editions? What is the circulation? A. Roughly, one is about 80—the City edition, called the City edition, which is made for a radius of 50 miles of New York—this is what is termed the City edition, and then they have an out of town edition which carries some advertising which is not in the (222) original edition. That is probably—oh, 170, 165. It varies a little bit each week.

Q. You mean 165,000 copies, do you? A. That is right.

Q. And the City edition 80,000 copies? A. Right.

Q. What other magazines do you print on these rotary web perfecting presses with the heat dried ink, out there at Conde Nast? A. Well, we have several. We have Nation's Business.

Q. Can you tell me roughly the circulation of that? A. I wonder if that is the right thing to do.

The Court: What is that?

The Witness: The circulation of various magazines; regardless of what they are, many publishers are very meticulous about that.

The Court: Aren't these audited? Don't they audit them?

The Witness: Oh, yes. There is no discussion about that.

The Court: I mean doesn't the world know that?

The Witness: Well, the A. B. C.—the American Bureau of Circulation—audits it, but many times they print more than the guarantee for you. I do not know whether there is any objection or not.

Mr. Byerly: I should not imagine there would be, (223) your Honor, because it seems to me most of these publishers are always telling how big their circulation is.

The Witness: You would be surprised if you were a publisher.

The Court: Well, the Court has no objection. Suppose you go ahead.

Q. Just give it approximately.

The Court: Approximate your figures.

A. Well, Field and Stream, about 350,000; Charm Magazine, about 330,000; Grade Teacher, 120,000; The New Yorker, 80,000 and 170,000; Glamor, 400,000; Nation's Busi-

ness, 400,000; Skyways, 200,000; Air Progress, about 200,000. That is approximately all.

The Court: Those are all weeklies?

The Witness: No, they are monthlies. The New Yorker is the only weekly magazine we have.

Q. The New Yorker is a weekly, and the others you mentioned are monthlies? A. That is right.

Q. Looking again at Plaintiff's Exhibit 14 for a minute, which shows one of these web perfecting presses on which you used these Vaporin heat-dried inks, do you make any regulation of the amount of heat applied to the paper by the heaters? A. Oh, yes.

Q. How do you regulate that? A. There is a valve (224) there with which you can regulate the amount of heat that is needed. It all depends on the type of paper you are using and the amount of color you desire to carry. If you need more color you have to carry a little more heat on it.

Q. That is, there is more ink on the paper? A. That is right. If you have a minimum of ink on the paper you carry less heat on it.

The Court: That heat is created by gas?

The Witness: Gas.

The Court: Natural gas.

The Witness: No, City gas.

The Court: By City gas?

The Witness: Yes.

Q. Does the speed of the web have anything to do with the amount of the heat? A. Well, it works in conjunction one with the other. The amount of ink you carry plus the speed of the web is the way you adjust the amount of heat.

Q. I suppose in any case you do not use any more heat than you have to to dry the ink on the web? A. That is right; especially in these days.

Mr. Byerly: That is all.

Cross examination by Mr. Free:

Q. You also have rotogravure presses up there? (225) A. No, we do not.

Q. You have worked with them, haven't you? A. I have only worked around them; I haven't worked with them.

Q. How long ago is it that you worked around them? A. Offset—on rotogravure?

Q. Yes. A. Never worked on it.

Q. Do you know anything about it? A. Very little. I have been around plants where they have had them, like in Jersey City. I have been through their plant and talked about them and discussed them, and I understand the principles of them to a certain extent. I do not profess to know little or a lot about them.

Q. You have seen how they work? A. I have seen them—mechanically I have seen not a lot about them. That is too difficult, but I never worked with them.

Q. But you do know that they deposit ink on the web and the web is heated afterwards? A. Yes.

Q. To drive off the solvent; is that right? A. Yes.

Q. Now can you name some very great magazines, from your experience as a printer, which use rotogravure? A. Collier's is using it.

Q. Collier's? A. Crowell. They use a lot of gravure.

Q. How about the relative speed of production between gravure and heat-set ink? A. Yes, I have seen gravure presses run much faster than the present heat-set presses (226), that I am familiar with.

Q. The quality of the modern rotogravure press is pretty high, isn't it? A. Well, that again depends on the nature of the purchaser of it, but I think they do a good job.

Q. In many instances the rotogravure quality is better than the heat-set ink quality, isn't it? A. In many instances their detail, because of the ink or maybe possibly a combination of their etching and the thinness of their ink, that gives them a lot more detail than you get in heat-set or letterpress printing, as I would term it.

Q. How long ago was it that you first saw a rotogravure press in operation as we have been talking about it here? A. Oh, about six or eight years ago.

Q. You have seen it much earlier than that, too, haven't you? A. No sir; not rotogravure, no.

Q. You know gravure presses have been in use for 15 or 20 years? A. Oh, surely, but I have never had occasion to be tied up with them.

The Court: They use heat, too?

The Witness: They use heat afterwards, yes.

Q. The processes of heat-set printing and rotogravure printing are generally about the same, aren't they; that is, the web is heated after it comes off the press? (227) A. Yes. The gravure is heated mostly with hot air.

Q. Yes. Have you ever seen any hot air heaters on heat-set ink? A. Yes, I have. Radio Guide has them in Chicago. As a matter of fact, they have a combination—Radio Guide has a combination of gravure and letter press printing all on the same machines.

Q. They both work at about the same speed; they have to? A. They do, yes; as a matter of fact the magazine is made simultaneously.

Q. Do you know what is in the inks that you are using now with this heat set process? A. What is that?

Q. What is in the inks? Do you know what the solvent is? A. Specifically, no.

Q. Did you ever notice the smell of it? A. Yes.

Q. It smells something like kerosene? A. Well, everybody smells differently. It just smells like a lot of solvents to me.

Q. Can you characterize it? A. There are a lot of inks that have that kerosene smell.

Q. A sort of petroleum oil smell? A. Sometimes a resin oil smell, but you might say kerosene does—it does smell like kerosene also.

Q. What sort of rollers do you use on your presses? A. Rubber.

Q. Rubber rollers? A. Synthetic rubber.

(228) Q. They get pretty hot, don't they? A. No, I do not think they get as hot as the other type. We have perfected in a few units of our presses—you say they get hot. Yes they do, but there is a method of water-cooling the drums, the distributing drums, which we have done on two units, and whether we can do it any more or not remains to be seen.

Q. I am talking just about the ink rollers. Do they get pretty hot? A. The rubber rollers get hot, yes.

Q. Plenty hot, don't they? A. Well, good enough. I do not say they get so hot that they impair the quality.

Q. You start with a cold press, and then as you increase your speed over a long period of time the friction between the rollers and the tack of the ink makes that get pretty hot? A. Well Vaporin ink is not very tacky: It is very loose ink. Nevertheless the rollers get hot. It wouldn't be because of the tack.

Q. How hot do they get? A. That is hard to say.

Q. 145 degrees Fahrenheit? A. That is hard to say—but easily around that. I do not think anybody has ever measured it. I do not think anybody has ever taken the trouble to measure it.

Q. How long have you been using rubber rollers? A. About five years.

(229) Q. Ever since you have had this heat-set? A. No, we tried—we thought we could get along—at that particular time of rubber rollers in the Vaporin field, the manufacturers of rubber rollers weren't sold on the idea that they could make a synthetic rubber roller that would be satisfactory for Vaporin inks, because they did not know enough about Vaporin inks themselves. Of course they had been using them with oil inks, so we did not buy rubber rollers until about a year later when we installed the presses, but we found it was very necessary to do it.

Q. When did you say you left Southgate Press? A. Oh, just around 1917.

Q. What sort of press did they have there? A. They had an old Cotterell there.

Q. Those presses had heaters on them too? A. No, no.

Q. Did you ever have any flat bed presses? A. They never knew what a heater was in those days.

Q. Did you ever have any flat bed presses? A. Where?

Q. At "Modern Priscilla", Southgate? A. Oh, yes; plenty.

Q. Those had heaters on the end? A. Little gas jets, that is all.

Q. And the sheets, after they were printed, passed over the jets? A. Mostly used to take static out of (230) the press.

Q. And they also helped to dry the ink? A. Oh, yes.

Q. Any heat would help dry the ink? A. It would help, unless the ink was bum.

Q. These tympan rollers are treated to repel the ink? A. Yes.

Q. They are not blotters? A. No. They are a manila which is treated with a certain oil in order to repel the ink, as far as they dare go with them.

The Court: Repel ink?

The Witness: Repel. I mean they repel it from transferring. It is a sort of oily surface, you might say. Some use paraffin and different oils which they use—I don't know just what they do use. I know they use a certain kind of paraffin.

Q. Some of them are even sandpaper? A. Well, those are not used as much as travelling tympans, as they are used in high speed presses which attempt to run without heaters. They are a sort of carbon sheet.

(231) The Court: Do any presses run at high speed without tympans or heaters?

The Witness: There are newspaper presses. It all depends on the quality of the printing you are trying to produce.

Q. What connection is there between the Conde Nast Company and the Interchemical Corporation? A. Only they supply us with ink.

Q. You have a contract for ink? A. I do not know whether we still have a contract. We did at one time.

Q. I understand that Dillon, Read financed your corporation at one time? A. That is in the management end of the business.

The Court: What has that got to do with this case?

Mr. Free: It is the same financial control, the I. P. I., the plaintiff here, and the Conde Nast Company, that is all. If he does not know—

The Court: He does not know.

The Witness: I am not in the financial end of this business.

Q. In your many years' experience with presses did you ever have occasion to look into the composition of the inks you used? A. We look into them as far as the raw material we purchase is concerned; otherwise we buy our (232) ink in bulk. We do not go into them from the very inception of them. We will buy certain reds and blues and we blend them all in our plant. In other words, we buy them in bulk. As far as going into the chemical analysis of the ink, why, we have a man in the plant that takes care of that. I do not bother with it.

Q. You buy the ink to fit the paper? A. Naturally.

Q. And the press, and it varies in viscosity from one time of the year to the other? A. Not only from one time of the year to the other but it varies according to the type of sheet or paper you are going to print on, as well as the type of machine you are going to use it on.

Q. What you are interested in is the quality of the printing? A. The net result.

Re-direct examination by Mr. Byerly:

Q. You referred to a gas flame removing static. A. That was on the old flat bed type of press. There is a certain amount of static in the paper that is generated in the sheet as it passes through, many times due to atmospheric conditions, on possibly paper which is green from the mill or dampness like this, and the sheet passing over the gas to a certain extent removes the static which is developing in the sheet passing through the machine.

Q. I do not yet know what you mean by static, what (233) effect does that have on the sheet? A. The static causes the sheets to cling to the press. You could take two sheets of paper with static and hold them up like that and they will stick right together.

Q. I take it that is static electricity? A. Yes.

Q. These little gas burners eliminated that so the sheets do not stick? A. That is right, as well as set the ink to a certain extent, naturally.

Q. When you are using these oil inks on these flat bed presses with these little burners, how long was it before the ink was dry? A. Oh, eight or ten hours.

Q. That is, the drying time was not substantially changed with these little gas burners? A. Not a lot, but naturally it helped it a little bit.

Q. Why didn't you use gravure presses for the New Yorker when you were getting new presses? A. That is their magazine. They know how they want it printed and we have no control over it. I do not think we could sell them the idea of gravure.

Q. They would not be satisfied with the way gravure prints? A. I do not know whether they would or not. They dictate their terms to us, what they want done, and that is our job just to produce it. We do not discuss with them how they shall run their business.

(234) Q. Do you know which is more generally used in printing magazines of large circulation, the ordinary typographic letter press printing or gravure? A. I say it offhand there is more letter press printing done, but I will say gravure is making very fast steps.

The Court: How is Life?

The Witness: Letter press.

Q. How about the Saturday Evening Post? A. That is a letter press job.

Q. And Collier's I think you said use some of each? A. They are using both. They are using them in conjunction one with the other.

Re-cross examination by Mr. Free:

Q. Have you used an offset roll on the second impression cylinder? A. No, and we do not use an oil motion either.

Mr. Free: This being rebuttal, I move to strike it out because there is no connection between it and the ink of the patent in suit. This witness knows nothing about the ink.

The Court: We will reserve judgment until we get to rebuttal.

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(235) CALVIN DETRICK, resumed the stand.

Direct examination by Mr. Byerly:

Mr. Free: Is this more rebuttal, may I ask Mr. Byerly?

Mr. Byerly: No, I offer this as part of the *prima facie* case, your Honor.

Q. What is your business, Mr. Detrick? A. Manufacturing printing inks.

Q. What concern are you with? A. Finne-Detrick Incorporated.

Q. Do you know Dr. Gessler? A. I do.

Q. Have you know him for some time? A. 25 years or more.

Q. Were you ever with the Manufacturers Printing Ink Company? A. Yes.

Q. When were you with them, Mr. Detrick? A. From about 1929 to 1938.

Q. What was your position with that company? A. Vice-President.

Q. And did you obtain any materials for making inks from Dr. Gessler when you were with the Manufacturers Printing Ink Company? A. I did.

Q. Just what sort of things did you get from Dr. Gessler at that time? A. I got varnishes that were made of nitrocellulose with solvents.

(236) Q. Did you mix pigments in those and make them into inks? A. Yes.

Q. Who was the man in your company, that is, your company at that time, the Manufacturers Printing Ink Company, who did the actual mixing up of the ink? A. Gilbert W. Stratton.

Q. Did the inks which you made from Dr. Gessler's varnishes differ in any way from ordinary printing inks? A. Definitely, inasmuch as they dried with heat, whereas ordinary printing inks did not, that is, dry instantly with heat.

Q. Did you take any of these inks made with these varnishes such as you got from Dr. Gessler to the Kalamazoo Vegetable Parchment Company, in Kalamazoo, Michigan? A. Yes.

Q. Did you introduce the inks to that company, that is, the use of them? A. I did.

Q. I show you some letters which purport to be signed by you and which have been marked in connection with a deposition taken in Kalamazoo as Hayward Exhibit 1, Hayward Exhibit 2, Hayward Exhibit 3, Hayward Exhibit 4, Hayward Exhibit 5, Hayward Exhibit 6 and Hayward Exhibit 8; are these letters which you wrote and signed, Mr. Detrick? A. Yes, all with the exception of two that were signed by Mr. Winchell in my absence, but I (237) dictated the letters.

Q. He was connected with the Manufacturers Printing Ink Company? A. Yes, he was secretary and treasurer.

Q. These letters are dated from December 21st, 1932, to June 2nd, 1933, are they not? A. Yes.

Q. Now, will you, if you need to do so, refresh your recollection from those letters and tell us what you did about introducing this ink at the Kalamazoo Vegetable Parchment Company? A. I first took it up with Mr. Kindelberger, who was then president of the Kalamazoo Vegetable Parchment Company in Parchment, Michigan. He told me they would be very much interested in an ink of that character. After a short space of time I was turned over to Mr. Hayward, who was then vice-president, and I carried on all my work with Mr. Hayward. He asked me to send out samples, which I did not want to do at that time. I told them I would rather be there when the ink was run. They acceded to that. I sent out ink and went out when it was run, went into the pressroom and ran the ink. I think it was on Heinz job.

Q. What kind of a press was that run on, Mr. Detrick? A. It was a rotary press. It may have been a Cotrell, but I am not sure.

Q. Was it a web press, that is, did it print on a (238) web of paper? A. Yes, the paper was taken from the roll and then cut off in sheets.

Q. Did it pass over any kind of a heater after it was printed, the paper that you tested this ink on? A. Yes, it must have, because the sheets came off dry. I want to

correct that statement, that statement before. It was taken from a roll and rewound. They were not cut off in sheets, so it had to go over a heater and dry.

Q. It went over a heater and then was rolled up in a roll again? A. Yes.

Q. Was it dry enough so it did not stick on to itself when you rolled it up again? A. Yes.

Q. As a result of your demonstration out there did your company, Manufacturers Ink Company, receive an order for some of its new printing ink? A. Yes.

Q. Can you recognize the paper which I now show you, which is marked Hayward Exhibit 7? A. Yes.

Q. What is that? A. That was the Heinz yellow, red and blue I mentioned before.

Q. You mean that is what the ink was used for? A. Yes, that was used on that particular job.

Q. But this document here— A. Is an order from the Kalamazoo Vegetable Parchment Paper Company to Manufacturers Printing Ink Company.

Q. It calls for two hundred pounds of ink, does it? (239) A. It calls for 200 pounds of yellow, 65 pounds of blue and 6 pounds of red.

Q. Did you or your company, Manufacturers Printing Ink Company, deliver this ink? A. Yes.

Q. Do you remember the date on which you delivered it? A. It was 1933, May 1933.

Q. Did you sell any more of this ink to the Kalamazoo Vegetable Parchment Company after that? A. No, sir.

Q. Was the ink which you sent out to the Kalamazoo Vegetable Parchment Company made from the varnishes which you obtained from Dr. Gessler? A. Yes.

Q. Did you testify in some other proceeding about this matter some time ago, Mr. Detrick? A. I did, in 1938.

Q. And Mr. Stratton, who was also with your company, testified at that same time, did he not? A. Yes.

Q. Mr. Stratton had personal knowledge of the way the Manufacturers Printing Ink Company's inks were made and what they were made of, did he not? A. He did.

Cross examination by Mr. Free:

Q. That run out at Kalamazoo, Mr. Detrick, was a trial run, wasn't it? A. Yes.

Q. You never got any more orders after that? A. No.

(240) Q. Going back to these varnishes that you say you got from Dr. Gessler, did you ever get any inks from him? A. No, sir.

Q. Just varnishes? A. Varnishes.

Q. Is a varnish an ink? A. No.

Q. It is a long way from an ink, isn't it? A. It has to be formulated into an ink.

Q. And that takes a long time sometimes, doesn't it? A. Sometimes.

Q. And you fit the ink to the press that it is going to go on? A. And the paper stock.

Q. And you vary it from time to time in accordance with the pigments you use? A. That is right.

Q. Mr. Stratton, who I understand worked with you on that, said that Dr. Gessler showed no evidence of any ink knowledge at all when he first came to your company, does that accord with your recollection?

Mr. Byerly: I object to that as misquoting the witness Stratton.

The Court: He has not testified here?

Mr. Byerly: No, he has given a deposition and did not make that particular statement.

The Court: You can ask the witness if that is correct.

Q. At Q46. in the Stratton deposition he was asked:

(241) "Q. Did you ever receive any inks from Dr. Gessler? A. Well, Dr. Gessler did not know anything about ink. He was a dry color man, working for the Zinsser Company. I think I said that." A. That is correct.

Q. How did Dr. Gessler come to you with the problem? Did he tell you what he wanted to do? He said he had var-

nishs, for example, and he wanted some help to make them into inks? A. Dr. Gessler and I have been friends for a good many years, and I guess it was out of friendship that he first brought the subject up with me. He asked me whether I thought an ink of that type would be salable, and I told him yes. He asked me if I would like to work on it with varnishes that he had, and I told him yes. That was when we started.

Q. Then you put Mr. Stratton on the job to help Dr. Gessler because he was a skilled ink chemist? A. Yes, sir.

Q. How long did Stratton work with Dr. Gessler on inks? A. Up until the time that we produced an ink that ran satisfactory on the press, all during which time Dr. Gessler was developing different varnishes.

Q. And Mr. Stratton would take those varnishes and try to make inks out of them? A. Yes.

Q. Over what period of time was that before you first had a usable ink, months, years? A. I would say (242) approximately a year.

Q. And it took Mr. Stratton that long to make an ink out of Dr. Gessler's varnishes? A. No, well, the varnishes were changed from time to time; as we ran into difficulties those difficulties would be overcome.

Q. You tried first one varnish and then another? A. Yes.

Q. And from those Mr. Stratton tried to make an ink? A. Yes.

Q. And after trying first one varnish and then another, it took about a year to get an ink which would work, is that right? A. I believe that is right.

Q. On this Kalamazoo run that you witnessed I think you said that the paper was rewound on a roll, is that right, after printing? A. To the best of my knowledge, yes.

Q. It seemed to me that you were not certain whether the ink had been heated in its course. A. No, I do not know that it was not. It was a long while ago.

Q. You are not sure that heat was used at that time? A. I believe heat must have been used, because it was re-

wound and would have to be dry or it could not have been rewound.

Q. Yes, but you don't know for a fact that heat was used? A. I am pretty sure.

(243) The Court: You are pretty sure it was?

The Witness: I am pretty sure it was, yes.

Q. See if this is in accordance with your knowledge. I heard that you and Mr. Finne and Dr. Gessler had an agreement as to the exploitation of this heat-set ink; was there such an agreement? A. No, there was nothing other than friendship.

Q. Was there any dispute as to who would take out the patent that is here in issue? A. Not that I know of personally, except what Mr. Finne has told me.

Q. Mr. Finne is now a partner of yours?

Mr. Byerly: I move to strike out what Mr. Finne told him.

Mr. Free: He has not told him anything yet.

Q. Mr. Finne is connected with you now, is he? A. Yes.

Q. Is he here in town? A. He is.

Q. He knows the circumstances I inquired about, as far as you know? A. As far as I know.

Mr. Byerly: I would now like to have read into the record the deposition of Mr. Stratton, which has been referred to. I will ask my associate, Mr. Watson, to read the deposition.

Mr. Watson: GILBERT W. STRATTON, produced as a witness on behalf of plaintiff, having been by me, the (244) said Frank M. Harker, as Notary Public, as aforesaid, first duly cautioned and sworn to testify the truth, the whole truth, and nothing but the truth insofar as he should be interrogated, was examined upon oral interrogatories, and he did thereupon depose, testify and say as follows, viz.:

Direct examination by Mr. Watson:

Q1. Will you state your name? A. Gilbert W. Stratton.

Q2. What is your home address, Mr. Stratton? A. 244 East Pearson Street, DeWitt Hotel, Chicago, Illinois.

Q3. What is your occupation? A. Technical Service Manager for Fuchs & Lang Division of General Printing Ink Corporation.

Q4. Where is your office located? A. 120 West Illinois Street, Chicago.

Q5. Were you ever employed by Manufacturers Printing Ink Corporation? A. Yes, I was.

Q6. When, can you say? A. From, I believe it was, October, 1928, up until March 1st of 1938.

Q7. In what capacity were you employed by them? A. Production Manager, Chemist, everything; complete charge of manufacturing and formulating and matching the colors and service work.

(245) Q8. Were you acquainted with Mr. Detrick while you were employed by that company? A. Yes, indeed.

Q9. He was also connected with that company? A. He was a salesman for the same concern.

Q10. Were you also acquainted with Dr. Gessler? A. Dr. Gessler I met with Mr. Detrick.

Q11. Dr. Gessler was then connected with the Zinsser Company, was he not, at that time? A. That is right.

Q12. Did you receive varnishes from the Zinsser Company? A. We did.

Q13. While you were employed by the Manufacturers Printing Ink Corporation? A. Shall I say "I," or "we"? I mean, is it individual testimony? That I received them there for the concern, or——

Q14. What were the facts? Did you personally receive them? A. Yes, the varnishes were brought to me directly.

Q15. I see. What did you do with those Zinsser varnishes, Mr. Stratton? A. I formulated them into printing inks.

Q16. Did you know, while you were employed by Manufacturers Printing Ink Company, that there was a break between that company and the Zinsser Company? A. I did.

(246) Q17. They no longer received varnishes from the Zinsser Company after that break? A. No, I do not believe they did.

Q18. Did you continue to make inks, utilizing the type of varnishes you received from Zinsser after that break? A. Yes.

Q19. How did you do that? A. Through help with a friend of mine who was a chemist for the Keystone Varnish Company. I know they were cellulose vehicles and by a little research, we found out what viscosity Keystone had used and made other vehicles that were just as satisfactory.

Q20. Those other vehicles contained nitrocellulose? A. Yes.

Q21. Did they also contain a solvent? A. I don't quite remember whether there was a solvent. I know we added solvents to them in making inks.

Q22. What solvents did you use? A. Well, the usual plasticizers, which was dibutylphthalate.

Q23. Anything else? A. Butyl carbitol.

Q24. Mr. Stratton, I show you a small slip of paper, which is marked at the lower righthand corner, "Ex. 93 6/22/38" (handing document to the witness), and ask you whether you can identify it? A. Yes. That is a formula that I made up, using the vehicles and made it into a (247) workable ink; in other words, an ink that would run on a printing press.

Q25. This is a formula and ink that you made then? A. Yes. That is my writing.

Q26. Is that formula in your own handwriting? A. Yes, sir.

I offer the formula identified by the witness in evidence.

Mr. Free: It has no connection with this ink, or certainly is not proven. It is some notes that he made that are undecipherable.

The Court: I think the objection is good.

Mr. Watson: (Continuing)

Q27. Mr. Stratton, do you remember shipping to Kalamazoo Vegetable Parchment Company inks containing nitrocellulose and butyl carbitol? A. Yes, I do; a yellow and blue, I believe. I believe there were two colors.

Q28. Were those inks compounded by you? A. They were.

Q29. What vehicle did you use in making those, do you remember? A. You mean what type of vehicle? Do you mean what cellulose vehicle?

Q30. Do you remember the source from which you obtained the vehicle? A. I believe that came from Keystone (248) Varnish. The records of Manufacturers Printing Ink could prove where they came from.

Q31. What type of varnishes were they? A. A cellulose vehicle.

Q32. That is, nitrocellulose and butyl carbitol? A. With plasticizers, I believe; use plain castor oil with it as well as carbitol and dibutylphthalate, with pigments.

Q33. Was this Keystone Varnish Company that you spoke of concerned with furnishing you with the nitrocellulose butyl carbitol varnishes after the break between your company and the Zinsser Company? A. Yes.

By Mr. Watson: That is all.

Cross-examination by Mr. Free:

Q34. In your direct examination I think you said that you used the usual plasticizers in some of these varnishes and inks. A. Well, I——

Q35. Did you mean to include butyl carbitol as one of those plasticizers? A. I did.

Q36. When did you first learn of butyl carbitol as a solvent for ink resins or varnish resins, or similar materials? A. Well, I believe it came out in 1929 through one of these solvent vendors. Whether it was Commercial Solvents or Advance Solvents, I forget; although they had used them. They were commonly known to the trade as (249) solvents for nitrocellulose.

Q37. The source of the butyl carbitol may have been Carbon & Carbide Solvent Corporation? A. It could have been. They are one of the solvent vendors.

Q38. Did you also hear of the cellosolves as solvents for ink resins at about that same time? A. Well, there was quite a list of them at that time. I don't remember just what classification they were in, in what group; but there were many general solvents, butyl lactate, and butyl carbitol. I don't know just which one was used at that time.

Q39. Well, all of them came out about the same time? A. About the same time.

Q40. As far as you know? A. Yes.

Q41. I believe you said, or indicated, on your direct examination, that you matched the solvent, when you began to obtain varnishes from Keystone. How would you go about doing that? A. Well, from the evaporation point.

Q42. Do you know whether or not there were available on the market at about the same time high-boiling petroleum fractions? A. Yes, there were. There were fractionate derivatives of kerosene.

Q43. How would you go about fractionating kerosene to get a petroleum solvent matching butyl carbitol? A. By using other materials with it, such as naphtha, varnaline. (250) You see, all materials in those days were in their infancy. Since that time we know a whole lot more about it.

Q44. And as those new solvents were made available on the market, you, as an ink maker, would try them out and use them if you found them suitable? A. Absolutely. The

main thing is to get the converting point between the solvent and the gum, to get your hardness of film and to get evaporation.

Q45. Now, as I understand it, you received only varnishes from Dr. Gessler; is that right? A. That is correct.

Q46. Did you ever receive any inks from Dr. Gessler? A. Well, Dr. Gessler did not know anything about ink. He was a dry color man, working for the Zinsser Company. I think I said that.

Q47. How did you arrive at the conclusion that Dr. Gessler knew nothing about making inks? A. Why, he presented vehicles to me, to see if I could make an ink that would work.

Q48. And with those vehicles that were presented to you, you succeeded in making an ink? A. I did. I ground pigment into the vehicles and made a workable consistency.

Q49. And in doing so, it was necessary to adjust (251) the vehicle, to obtain proper consistency, was it not? A. Definitely; yes, indeed. We had a lot of cross fire on the vehicles, working on different types, so that it would be more compatible with the pigments.

Q50. These varnishes which you obtained from Dr. Gessler were comparable to what other varnishes; for example, linseed varnish? A. You mean in consistency?

Q51. As to consistency. Go ahead and answer it. A. As to consistency?

Q52. Yes. A. About equivalent to a No. linseed lithovarnish, which would be in the Bureau of Standards in Washington. I believe in that formula that the different designations, "Varnish" are by letters. Mr. Watson showed me one that has an "L"; yes, "L A", "L. T." There were different consistencies of varnish there in that formula.

Q53. How long did it take you to make a workable ink from the varnishes which you understood Mr. Gessler sent? A. Oh, it was quite some time.

Q54. A matter of days or weeks? A. Oh no; many weeks.

Q55. How many different kinds of varnish did you try, approximately? A. You mean samples that were sent over?

Q56. Yes. A. Samples of varnishes?

(252) Q57. Yes. A. Oh, I would say maybe a dozen or more.

Q58. Some of those varnishes that you tried were made up by you, as I understand it? A. No, not of the first varnishes.

(253) *Re-direct examination by Mr. Watson:*

Q71. Mr. Stratton, it is quite customary for ink makers to make changes in the formula for the ink, to obtain proper working consistency, is it not, when different pigments are used? A. Yes, indeed.

Re-cross examination by Mr. Free:

Q72. As a matter of fact, you change the ink from one season on to another? A. We have to. Summer conditions and winter conditions, and high humidity, all of these things alter the inks.

Q73. An ink maker has often been referred to, to my knowledge, as a sort of a "custom tailor". A. That is right.

(254) Q74. He fits the ink to the job? A. It has to be compatible to the paper it is running on and the type of work that you want to obtain. In other words, you cannot take an ink on a bond paper and run it in a news stock. It has to be tailor made to that product.

Mr. Watson:

Q75. By the way, Mr. Stratton, you are testifying here today in response to a subpoena, are you not? A. Yes. I will say I brought it with me.

Mr. Free:

Q76. As a matter of fact, you would have come here today and testified without a subpoena, would you not?

A. I asked for the subpoena, more or less being with a big concern; I thought it would be better for a subpoena than to come down voluntarily. Maybe I was wrong in doing so, but I thought that would be the better way to handle it.

Q77. Do you know that General Printing Ink Corporation is a licensee under the patent here in suit? A. I know nothing about it.

Q78. Fuchs & Lang is a division of the General Printing Ink Corporation? A. Yes, of the General Printing Ink Corporation.

Mr. Watson: I will now offer the testimony of James M. Alden of Kalamazoo, Michigan, which has been (255) placed in the form of a stipulation by the parties. I believe the stipulation should be marked as an exhibit, or would you prefer to have it read?

The Court: I would like to have it read.

Mr. Watson: (Reading.)

Q1. Where do you live, Mr. Alden? A. My home?

Q2. Is it here in Kalamazoo? A. Kalamazoo.

Q3. What is your occupation? A. Manager of the International Printing Ink Company of Kalamazoo.

Q4. Do you ever go to the plant of the Kalamazoo Vegetable Parchment Company in connection with the sale of inks? A. Every day and sometimes more often.

Q5. Did you ever go there and find that they were using a heat-drying ink which you hadn't seen before? A. I did.

Q6. Do you remember when that was? A. I could tell when it was—around about September 16th.

Q7. What year? A. 1933.

Q8. Do you remember while you were out there, whether or not you learned the source from which the Kalamazoo Vegetable Parchment Company obtained the quick drying ink which you saw them using? A. I did.

Q9. Whom did they get it from? A. They got it from the Manufacturers Printing Ink Company of New York.

(256) Q10. Did you, at the plant of the Kalamazoo Vegetable Parchment Company, obtain any samples? A. I did.

Q11. What were these samples? A. They were samples of yellow and blue.

Q12. Were those inks which you saw them using in printing with heat-drying? A. They were.

Q13. And were those inks which they advised you they obtained from the Manufacturers Printing Ink Company? A. Yes, sir.

Q14. When did you get those samples? A. I got those on September 19th.

Q15. What year? A. 1933.

Q16. Did you send those to the manufacturing plant of the International Printing Ink Company? A. I sent the samples to the Battle Creek factory and also to our New York office.

Mr. Free: I would like to move to strike this deposition also. It has no connection with the ink here described. There is no mention of what is in it, and I do not think it adds anything to the case, and it is immaterial and irrelevant.

Mr. Byerly: It will be connected. It shows one of the stages in the movement of this ink, which we have traced from Dr. Gessler to Kalamazoo now through this (256a) gentleman to the International Printing Ink Company, and we shall hear more about it.

The Court: The motion is denied.

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(257) PAUL O. BLACKMORE, called as a witness on behalf of the plaintiff, being duly sworn, testified as follows:

Mr. Byerly: If your Honor please, this is a continuation of the events in Kalamazoo. This witness is on here from—is it Cincinnati, Mr. Witness?

The Witness: That is right.

Mr. Byerly: And he has reservations on the train this afternoon. Logically he ought to be the third witness, and if it won't inconvenience your Honor I would like to call him out of turn so that he can catch his train.

The Court: Very well.

Direct examination by Mr. Watson:

Q. What is your occupation, Mr. Blackmore? A. I am chief chemist for the Ault & Wiborg Corporation.

Q. Have you a laboratory? A. We do.

Q. Where? A. Located at the site of our factory in Cincinnati, Ohio.

Q. Who is in charge of that laboratory? A. I am.

Q. Has your laboratory anything to do with the making up of formulæ of material or compounds marketed by Ault & Wiborg? A. Yes, it does. All of the formulas of compounds manufactured by Ault & Wiborg originate in (258) the laboratory.

Q. Have you formulated a compound for a nitrocellulose butyl carbitol lacquer? A. We have.

Q. Have you ascertained from your records whether you have sold any such lacquer to the Battle Creek factory of Interchemical Corporation? A. I have.

Q. How much, do you know? A. Approximately 21,000 pounds.

Q. Do you remember the dates during which such lacquers were sold? A. From July of 1936 until November of 1942.

Q. Have you records of such sales? A. I have.

Q. Can you produce the invoices covering such sales? A. I can. These are the invoices (handing to counsel).

Mr. Watson: If your Honor please, I offer them in evidence.

The Court: Let me see them.

(Documents handed to the Court.)

The Court: You offer these in evidence?

Mr. Watson: Yes.

Mr. Free: Your Honor, again I must object. This is rebuttal. This is directed to commercial success. These invoices run into 1942.

The Court: Is there any issue about it?

Mr. Watson: No, your Honor, there is not. My (259) opponent has dwelt at length on cross examination on the alleged failure of the butyl carbitol inks. This evidence will, I submit, prove they were not a failure, they were still being used extensively.

Mr. Free: That is rebuttal.

Mr. Watson: I think that is a direct reply to what might well serve—not well serve, but what might possibly be attempted to be used as a basis for a motion to dismiss at the end of the *prima facie* case. In order to avoid that I am offering the evidence at this time.

The Court: Objection overruled.

Mr. Watson: Thank you, sir.

Now we have agreed that photostatic copies might be substituted for original records. Is that all right, Mr. Free, to use photostats?

Mr. Free: Yes.

(Marked Plaintiff's Exhibit 19.)

Q. I notice, Mr. Blackmore, that the invoices, Plaintiff's Exhibit 19, referred to nitrocellulose lacquer K-484. What does that mean? Is that the way in which it was ordered, or is that a symbol of yours, or what? A. That is a symbol of the International Printing Ink Corporation by which they order the materials from us.

Q. I note also that the invoices contain other symbols, namely, 895-1 and W4608. Can you tell me what those symbols (260) are? A. The 895-1 is a laboratory designa-

tion that was given to the material when it was in the sample stage. The 4608 is the manufacturing symbol that was given to it by the factory when it was placed in commercial production. Those are both Ault & Wiborg numbers.

Q. Is that in accordance with the regular practice of Ault & Wiborg? A. It is.

Q. How do you identify the raw materials from which the formulas or compounds manufactured by your company are made? A. The raw materials for the sake of convenience are given code numbers rather than being called by name.

Q. Do you keep in your laboratory a file of the formulae of the various materials your company manufactures? A. I do.

Q. Can you produce the formula or formulae for the nitrocellulose lacquer having your laboratory code number 895-1 and the manufacturing code number W4608? A. I can.

Mr. Watson: I offer those formulae in evidence as Plaintiff's Exhibit 20.

The Court: Let me see them.

(Documents handed to the Court.)

The Court: That is nitrocellulose?

The Witness: Nitrocellulose.

The Court: Nitrocellulose lacquer?

The Witness: Yes sir.

(261) Mr. Watson: I offer the set of formulae cards in evidence as Plaintiff's Exhibit 20.

(Marked Plaintiff's Exhibit 20.)

Q. Will you please refer to those formulae cards for the moment, Mr. Blackmore. A. I will.

Q. I note that one is entitled "Standard Formula". Will you explain what that is? A. The standard formula

is the master formula from which all subsequent batch cards are taken.

The Court: By "formula cards" you mean the formula for making up the various products?

The Witness: Yes; when an order is received in the factory for any type of material.

Q. On that standard formula what does the code number 2402 mean? A. One-half second nitrocellulose.

Q. The code number 2408? A. One-eighth second nitrocellulose.

Q. The code number 2515? A. Butyl carbitol.

Q. I note that you have also produced three formula cards, marked "Master Formula". Could you explain the significance of those? A. Those master formulas are formulas that are on file in the manufacturing clerical office, and keep the records of any changes that may take place from time to time due to the variation in raw materials.

(262) Q. In those master formula sheets you have on each code number "V2402". What does that refer to? A. That refers to one-half second nitrocellulose.

Q. And likewise code number V2408. A. It refers to one-eighth second nitrocellulose.

Q. And also V2515. A. That refers to butyl carbitol.

Q. How do you identify the containers of these materials at your factory? A. The raw materials generally are identified by both the name of the material and our code number.

Q. What is the practice when a material manufactured by your company is compounded? A. Well, starting from the raw material, the raw material when received is sampled and taken to the analytical laboratory and tested, to determine whether or not it conforms to the specifications we have set up for that raw material. If it does it is so marked and turned over to the factory for their use. The formula cards or batch cards from which the material is manufactured are then issued from these standard or

we would send him samples for color matching when we knew what designs we were going to run.

Q68. Then did you actually order some ink from him? A. Yes, I have a copy of our order here somewhere. On May 26th we ordered 200 pounds of yellow; 65 pounds of blue and 6 pounds of red.

Mr. Watson: I will offer in evidence the order produced by the witness dated May 26th, 1933, addressed to the Manufacturers Printing Ink Corporation, Brooklyn.

(Marked Plaintiff's Exhibit 27.)

Q69. Did you receive the ink which you ordered on May 26, 1933? A. We received a letter on June 2nd advising us that the inks were being shipped on that day and that they should arrive in Kalamazoo on the following Tuesday.

Mr. Watson: I offer in evidence Mr. Detrick's letter of June 2nd, 1933.

(Marked Plaintiff's Exhibit 28.)

(281) Q70. Did you actually receive these inks in Kalamazoo? A. We received the inks some time before June 6th because on that date I telegraphed to Mr. Detrick that we expected to make a trial run on either the following Saturday or Monday.

Q71. When did you actually use these inks? A. We made the trial on the following Monday. I don't know what date that would be; that would be the Monday after June 6th.

Q72. Was that made with a larger heating drum; did you have that on at that time? A. Yes.

Q73. How did the inks work? A. They worked very successfully on that run, I would say.

Q74. Did you continue to use—first, on that first run with the big drum on these Detrick inks, was that commercial in the sense that you actually sold what was printed? A. Yes.

Q75. Did you continue to use these inks from the Manufacturers Printing Ink Company? A. No, on June 23rd Mr. Detrick wrote us confirming a visit that he had at our plant with Mr. Kindleberger on the previous week. At that time he gave Mr. Kindleberger a price on the ink and asking us for information on the volume we would (282) expect to use to see if they could make any better price. I replied to that letter—I was out of town when he called, and I replied to his letter on the 30th of June and told him the result of the tests showed a great deal of promise and I told him at that time we were installing a new press and that we would arrange to put a large copper drum on that press for commercial and regular production. The small press we had experimented on was not the kind of a press we would run a great deal of our difficult work on. I told him we expected to have that press ready to operate in about four weeks and I told him we would then have a good setup for using the ink, and I told him further that it was not possible to give him any estimate of the amount of ink we might consume over the balance of the year because we had to have more experience on the cost and so forth. I also mentioned in that letter a problem that was a serious one, and that is the fact that there is nothing standard in the designs we run, and we have no assurance of continued business of any one company. Consequently we couldn't estimate in any one color the amount we might consume and this incidentally was a serious complication in buying their ink because they were located so far from us.

Q76. Did you later find a source from which you would get a similar ink which was nearer to you? A. Yes, the (283) International Printing Ink Company submitted

samples of an ink, during that summer I would say, probably in August, which seemed to match the ink supplied by the Manufacturers Printing Ink Company in every respect and after we got our new press in operation, we tried out the International Ink and it produced all the results we got with the Manufacturers and we changed over our development program with the International instead of the Manufacturers.

Q77. Did you use up in commercial work the 200 pounds you bought from the Manufacturers Printing Ink Company? A. The test run that we made consumed practically all of the ink and that was shipped on regular order, yes. There was no further run made on that original 200 pounds. The original amount—it was more than 200 pounds.

Q78. I show you what purports to be an invoice—a series of invoices to your company from the International Printing Ink Company for ink, running from December 19, 1933 to January 29, 1936. Did you purchase the ink referred to on those invoices from the International Printing Ink Company? A. We did.

Q79. Did you yesterday have those invoices checked with your records to make sure you had received and paid for all that ink? A. Yes, sir.

Q80. Was that ink dried in the same manner you have (284) been describing, by a heated drum? A. Yes, it was all dried in that way.

Mr. Watson: I will offer in evidence the invoices shown to the witness, and ask that they be marked as a single exhibit.

(Marked Plaintiff's Exhibit 29.)

Q81. I note near the end of Exhibit 9 an invoice dated November 15, 1935, which appears to be for a considerable quantity of a so-called "Q D Varnish." Was that what is sometimes called a vehicle for making ink? A. Yes, sir.

Q82. What did you do with that varnish you obtained from the International Printing Ink Company? A. We found in 1935 that we could produce this heat setting ink, which we called lacquer ink because it contains nitrocellulose—we found we could produce this in our own plant and we started producing it in 1935 ourselves. The International Printing Ink Company had this supply of varnish on hand to take care of our requirements and we purchased the varnish from them and made it up into ink in our own plant.

Q83. And after that did you continue making a similar ink in your own plant? A. We have been making a similar ink to it ever since.

(285) Q84. Then to summarize all this, if I understand you correctly, you have been using a quick drying ink since June 1932? A. No, just a moment. It was June 1933.

Q85. Right, June 1933. You first obtained it from the Manufacturers Printing Ink Company, then from the International Printing Ink Company and then you made it yourself? A. That is correct. I might say that at the end of 1933 we found that the ink was of sufficient value in our operations so we equipped our presses with a ventilating system for removing the fumes of the solvents by ventilation.

Q86. Were all these quick drying inks you used commercially printed on a traveling web on a typographical cylinder? A. Entirely.

Q87. Was this ink more or less expensive than the regular linseed oil ink? A. It has always been more expensive than the regular linseed oil ink. That is the reason we have limited our consumption of it.

Q88. Under what circumstances did you use it commercially? A. We used it on those orders where there is a very rigid odor specification. In other words, where the customer insists that the ink be completely odorless, and then we use it on those orders where the ink coverage is so heavy that the ordinary drying would take too long, and

on those orders which require a very (286) rapid drying, and which do not permit the use of linseed ink.

Q89. What kind of rolls do you use on the presses where you print this ink with ink rolls? A. We use what are known as Ideal Rollers, which is a rubber roller which we coat with a composition to give it a normal surface of an ink roller.

Q90. When you are using linseed inks, how often do you coat those rollers? A. I couldn't tell you exactly. It is just a normal re-coating process. I suppose it would be, perhaps, every three or four weeks.

Q91. How often do you have to re-coat them when you are using these quick drying inks? A. A set of rolls on the quick drying inks will normally run about a week.

Q92. How much does it cost to re-coat these rolls? A. It is a very inexpensive operation. I couldn't tell you the exact amount. I know it is a standard method of re-coating and it is a very inexpensive thing to do.

Q93. Do you know what the vehicle is in the quick drying ink that you use since you started making them yourself? A. I understand it is butyl carbitol.

Q94. There is nitrocellulose also in these inks? A. I understand there is, yes.

(287) Q95. Mr. Hayward, the group of invoices which you have previously identified as Plaintiff's Hayward Exhibit 9 (Ex. 29), seem to cover purchases beginning on December 19, 1933 and ending on February 29, 1936, is that correct? A. Yes, that is right. These are all correct so far as I know.

Q96. These were previously identified? A. Yes.

Q97. I now show you another group of invoices extending apparently from August 12, 1936 through November 18, 1942, and ask you whether or not such invoices show purchases made from the International Printing Ink Company during that period and have been checked. A. These have been checked against our purchases. I did not personally check these, I had Mr. Wood check them.

Q98. Your answer is they have been checked? A. Yes, for both receipts and purchases.

Q99. You have ascertained that the ink referred to in these invoices was purchased and received by you? A. That's right.

Mr. Watson: I offer the group of invoices collectively in evidence.

(Marked Plaintiff's Exhibit 30.)

Q100. Could you tell us, Mr. Hayward, the purposes (288) which the ink covered by the invoices from 1933 to February 29, 1936 were used? A. They were used for printing waxed paper, either for carton wrapping or for bread wrapping.

Q101. And can you tell me the purposes for which the inks covered by the invoices in Plaintiff's Hayward Exhibit 10 (Ex. 30) were used? A. They were used for cartons and for bread wrapping and for imitation cork printing. They were used for printing imitation cork design on paper to be used for cork tipping cigarettes.

Q102. Were the inks covered by these two groups of invoices, Plaintiff's Hayward Exhibit 9 (Ex. 29) and Plaintiff's Hayward Exhibit 10 (Ex. 30), the type which are known as heat-set inks? A. Yes, sir.

Q103. Did you discontinue the use of such ink for printing wax paper? A. Yes.

Q104. Would you explain why, please? A. We discontinued them because the heat applied to the paper caused a variable moisture content in the sheet which in turn varied the working properties of the paper and we found other inks and methods of printing which accomplished the same results without the variable effect upon our paper itself.

Q105. What was the purpose for adopting the heat-set ink in the first place? A. That original experiment (289) was carried out with the hope that we could obtain

lower cost finished printing waxed paper because of the element of the long drying time we had with the oil oxidizing ink. The experiment or attempted work proved that the finished wrappers were more expensive than the use of oil ink with drying time. The quick setting ink had the properties of being completely odorless and so we continued the use on a more limited basis for the printing of those kind of wrappers where we wanted a wrapper that was free of odor and where we were pressed for delivery and had to eliminate the drying time for oil ink and in that kind of an order by the use of these inks we were able to accomplish the desired results. They were discontinued generally because of cost and were used in a limited fashion for emergency drying and for those designs requiring odorless ink.

Q106. Lack of odor is important? A. Lack of odor is important in some specifications. In others it is not so important.

Q107. And by odor you mean the odor characteristic of the old linseed oil varnish? A. That's right.

Q108. Did the heat applied to the printed paper which had been coated or treated in any way with wax have any effect on that wax? A. No. Our problem—I don't know as you want this in the record or not—but (290) our problem with the ink is that we have to vary the speed of the press in order to examine the printing and in varying the speed without being able to vary the temperature our paper will go dry and then become moist again. If we could have held it to one moisture we could have used it.

Q109. Were these inks stable on the press, Mr. Hayward? A. Yes.

Q110. Did they dry immediately on application of heat? A. Yes.

Q111. For what purpose are you now using these so-called heat-set inks? A. We are now using them for printing this artificial cork design for use in tipping cigarettes.

Q112. Then the problem of getting the paper too dry is not encountered in such use? A. It is not encountered so much, that paper is not waxed.

Q113. Did you find that the use of these inks enabled you to speed up the printing operations? A. No, actually our speed of printing was reduced and that was because probably of lack of sufficient area of drying, but actually we ran at a lower speed which partly accounted for the increase in cost and we didn't feel that the result justified adding enough additional equipment to get it back to normal.

(291) Q114. You would have needed other equipment? A. We would have needed more drying equipment and heating equipment to maintain normal speed.

Cross examination by Mr. Free:

XQ1. As I understand it, the problem of odor is of considerable importance to some of your customers? A. To some customers yes, to others it is not. Of course, severe odor would be a problem to any, but the odor that is normal to linseed oil ink is not objectionable to a large volume of our business.

XQ2. I understand in those cases where odor is important that factor was of considerable greater weight than the factor of speed. A. That is correct. Some specifications that had to be free of odor we ran them even though the cost was greater.

XQ3. Have you ever used any so-called heat-set ink which had odor after printing? A. I don't think we have. I could qualify that answer first that we would eliminate all gravure ink which is technically a heat-set ink, but that is all we do use that does carry odor. We eliminate all aniline ink. After elimination of aniline and gravure we are using some ink called Vapo-Set and hy-dry ink. These can technically be called a (292) heat-set ink and they do carry a very minor odor, less than that accompanying ordinary linseed ink.

XQ4. What causes the odor in the ink—the solvent usually, is it not? A. The odor in the linseed oil and other oxidizing oil inks is due to oxidation of oil and that is the cause of that odor.

Now, the odor in a heat-set ink—in the first place, there is not any odor with the heat-setting ink we have used.

XQ5. Which meant that the solvent evaporates altogether? A. That is correct.

XQ6. And is of such a nature as not to have any odor? A. That's right.

XQ7. What is the solvent you have been using in the heat-setting ink we have been talking about? A. The inks have been purchased as compound mixtures and I can't say definitely what the solvent is in them.

XQ8. When you gave your testimony in 1938 in this previous case in answer to question 93, your testimony reads, "Q. Do you know what vehicle is in the quick drying ink which you used since you started making it yourself? A. I understand it is butyl carbitol." A. Yes.

XQ9. I would like to know if butyl carbitol is still a solvent you were using in quick drying ink? A. If we made (293) them always that is what we did use.

XQ10. Have you ever used any other solvent than that in the ink you made yourself? A. I guess not.

XQ11. And now the ink you purchased or obtained from I.P.I., is that a heat-set ink? A. I think that is true.

XQ12. You don't know what is in them now? A. No, I wouldn't know about that.

XQ13. But they are still odorless in the same way they were before? A. Still carry on the same process.

XQ14. I noticed in the previous litigation you purchased some Q.D. varnish from Hilton-Davis Company of Cincinnati for the compounding of some inks, do you remember that? A. Yes, sir.

XQ15. Do you remember what solvent was in that varnish? A. If you want that answer I would have to call the ink department to go into that.

XQ16. Your answer is that you don't know yourself? A. No, I don't know.

XQ17. Have you ever heard of butyl carbitol acetate, a solvent used in heat-set ink in lieu of butyl carbitol? A. It has never been discussed with me as such.

XQ18. You don't know of it? A. No.

XQ19. The reason I ask that question is because one of Hilton-Davis's men told me that the varnish which you had been purchasing from that Company contained butyl (294) carbitol acetate instead of butyl carbitol? A. That I am not familiar with, it has either been sold to us as a varnish or as a direct solvent.

XQ20. I understand one reason why the change was made from butyl carbitol to butyl carbitol acetate was because the acetate was more stable on the press. Do you remember any improvement in the ink after you began making it yourself in that respect? A. I don't recall any definite change. Minor improvements could go on which I might not be familiar with.

XQ21. How much ink do you use in this plant, approximately? A. Total—all types and kinds?

XQ22. Yes. A. In pounds or dollars?

XQ23. Any comparative figure will do. Is it on the order of one thousand pounds a year or one hundred thousand? A. We use sixty or seventy thousand pounds a month.

XQ24. What proportion of that amount is this heat-set ink which you have been buying from I. P. I.? A. Only a fraction of 1%.

XQ25. What proportion of that ink which you use each month is gravure ink approximately? A. Approximately 25%.

XQ26. And the remainder is what? A. Well, the remainder is aniline or oil ink, aniline probably would run I would say 15% and the balance all oil ink.

(295) XQ27. In answer to question 85 in your earlier testimony you stated that at the end of 1933 you began to

equip your presses with a ventilating system for removing the fumes or solvent by ventilation? A. Is that on page 204?

XQ28. Yes. A. Yes.

XQ29. Were you ever present when the ink was being dried on the press at any time? A. Yes.

XQ30. Can you describe the nature of the odor of the solvents used? A. It is a sweet type of odor, if you call that a description.

XQ31. Have you ever been present in the intervening years since 1933 and noticed any change in the odor or fumes in the heat-set ink? A. I have been present. I have not noticed any change. On the other hand, our ventilating equipment is so much better today than it was that the odor is not prevalent in the press room as it was in the early days.

XQ32. Have you ever had occasion to smell the ink in the intervening years and detect any difference in the odor? A. I have not smelled of those inks, no.

XQ33. As I understand it, the printing paper which is to be coated with wax presents a considerable problem to you, especially where heat is used. A. "Considerable" is quite an indefinite thing.

(296) XQ34. Well, answer the question the best you can. A. You are asking me is it a problem to use heat on paper and then subsequently wax it?

XQ35. Yes. A. The problem of drying the ink with heat on the press is not a difficult problem, if you have sufficient heating capacity; neither does the waxing of that paper present any unusual difficulty, but in the operation of the press it is necessary to vary its speed to examine the printing either for coverage or register and when you vary the speed it is not possible to vary the drying heat with it and in consequence the paper at that slow speed gets very dry. Then when you wax that paper, that paper in the roll with the lower moisture content is very brittle and when you put that paper on a wrapping machine which is set up

for a certain standard moisture instead of a certain standard flexibility and when you run into that paper the paper breaks in the wrapping machine.

XQ36. So you are obliged to gait the printing to the waxing to get them working together? A. Yes, you have got to try your best to hold a uniform moisture content in the paper and then to apply heat and moisture and wax and bring them together to get the desired results. If your moisture in the sheet of paper varies, then you can't adjust for it because you (297) don't know where it varies or how much and in consequence you get a variable finished product.

XQ37. Have you ever had occasion to use cooling drums between the printing machine and the waxing machine to restore that moisture balance in the paper? A. We have used cooling rolls for the purpose of setting the ink, but a cooling roll would not restore any appreciable amount of moisture and will not restore a variable amount, depending upon a variable press.

XQ38. Have you ever had any difficulty with the ink bleeding into the wax by reason of waxing before the ink was dry? A. Not to my knowledge with the heat-setting ink.

XQ39. I ask that question because I understand that some of the wax paper people who have used heat-set ink do have that trouble with the wax becoming brittle and flaking off in addition t blurring or bleeding off. You have never had that trouble? A. No, because we have never printed except where we dry the ink. If you had printed using an oil ink, where the ink was not sufficiently dry, you would naturally expect that result.

XQ40. How hot approximately is the drum over which the web passes after being printed with the heat-set ink? A. We use steam pressure in the drum of about ten pounds (298) which would give a temperature of steam about 245 degrees F. That is the temperature of the steam. The temperature of the drum would be a few degrees lower than that on the outside.

XQ41. The drum has to be that hot to touch off the solvent in the ink? A. Yes, in addition to that we have also used flames directly on the printing side sometimes.

XQ42. Haven't you found that to be too hot for Parchment paper? A. Not if the press is running at its normal speed.

XQ43. The first heat-set ink you obtained from the manufacturers was not always stable on the presses, was it? A. Well, if it was not stable it would have been only in the first or second experimental runs. In other words, we tried one lot and it didn't work too well. Then we tried another lot and it worked better and my recollection was that it straightened out in stability rather quickly.

XQ44. How did that lack of stability manifest itself on the press? A. Mostly by drying on the printing rollers.

XQ45. Is that sometimes accompanied by tearing the web? A. Not that I recall, it was in the ink fountain itself.

XQ46. What did you do in that case, clean out the fountain and replace the ink? A. Those were in the (299) experimental stages of it and at the beginning it is my recollection we just cleaned out the whole thing and put it back.

XQ47. You never tried thinning it by more solvent to replace that which had evaporated? A. Not in that stage; we did at a later date.

XQ48. You do that now occasionally too, don't you? A. Yes.

Mr. Free: That is all.

Re-direct examination by Mr. Watson:

Q115. What sort of ink do you use on these bread wrappers or waxed papers, whatever it was, instead of heat-set ink when you abandoned the use of such ink? A. Part of the designs we changed over to aniline ink and in a very few cases we changed some to gravure and in others we changed it to an ink called vapo-set.

Q116. I am not sure whether I understood you correctly or not; did you say that in some cases where you needed especially fast drying ink you used heat-set ink? A. Yes.

Q117. Did you also say that the use of heat-set ink did not increase printing speed over the use of linseed oil ink? A. It didn't increase it, we run slower.

Q118. Why then do you use heat-set ink where you want—(300) where you had to make faster delivery? A. When we use oil oxidizing ink you have to let that paper stand sometimes from one week to ten days in the roll for the ink to oxidize before you can wax it and then the difference in the printing speed is practically nothing in comparison to the time involved for allowing the oxidizing oil ink to have time to oxidize.

Q119. Perhaps I should have said there was a difference in production speed rather than printing speed as between the two inks—speed of producing the finished product? A. Well, in the printing speed those rolls with heat-set ink, the time between when you start to print and when you get the wax on is much shorter than when you use an oil ink.

Mr. Watson: I see, that is all.

Re-cross examination by Mr. Free:

XQ49. I would like to ask you, Mr. Hayward, about the speed of printing with these gravure inks as compared with heat-set, which is faster in your experience? A. On a large gravure press the speed of printing is very much faster, but on a small three-color gravure press where our drying capacity on that press is limited, the speed is no greater than it would be with the heat-set ink.

(301) XQ50. That is because with the gravure ink you dry that also? A. You dry it and you are limited in drying capacity.

XQ51. Then you are all through with gravure ink after you have done drying? A. Yes.

XQ52. How do aniline inks work, are they treated with heat at all? A. The aniline inks, generally speaking, carry a more volatile solvent than any inks, and so they dry with practically no heat. We carry a fan on the surface of the paper and in some instances we have carried an electric infra-red light bulb that has applied a certain amount of heat to the surface.

XQ53. Do the aniline inks leave an odor? A. Not after the solvent is removed. To a large extent it is an alcohol solvent.

XQ54. Do you use aniline printed wrappers for food products? A. Yes, of all types.

XQ55. And wax them afterwards? A. Yes.

XQ56. Mr. Hayward, at my request you have produced the correspondence concerning the heat-set ink proposition you handled with Manufacturers Printing Ink Corporation, is that right? A. Yes.

XQ57. I note among the papers which you show me a memorandum from you dated February 23, 1933 to Mr. Shaffer. At the foot of this memorandum there is a longhand memo (302) signed "C. Shaffer". Do you recognize his handwriting and signature? A. That's right.

XQ58. Did you receive this memo from him? A. Yes.

Mr. Free: I offer in evidence as Defendant's Exhibit D the memo Mr. Hayward just referred to, and I have an original which I would like to substitute for the photostat, your Honor.

(Marked Defendant's Exhibit D.)

A. This definitely identifies this as the original sample of ink they sent us. My letters definitely identify that. They sent us a little can of ink about the size of this glass and from that small sample we made these hand printed proofs and dried them on a hot plate and waxed them by hand and these were our comments.

XQ59. These samples attached to Exhibit A-D (Ex. D) all seem to be the same, don't they? A. Just duplicate samples.

XQ60. I will leave one on and take off the rest. May I take this original for the exhibit? A. That is all right.

Mr. Watson: Then, Mr. Free, you have examined the file produced by Mr. Hayward and offered in evidence only the one report, is that correct?

Mr. Free: That is right.

(Adjourned to January 20, 1943, 10:30 a. m.)

(303) New York, January 20, 1943; 10:30 o'clock a. m.

TRIAL RESUMED.

Mr. Free: Defendant's counsel substitutes original document for photostatic copy of Defendant's Exhibit D.

FRANCIS JACK JEUCK, called as a witness on behalf of the plaintiff, being duly sworn, testified as follows:

Direct examination by Mr. Byerly:

Q. Where do you live? A. Chicago.

Q. What is your present position? A. Manager of the International Printing Ink Company's Chicago factory.

Q. That is a division of the plaintiff, Interchemical Corporation? A. That is correct.

Q. How long have you been with Chicago? A. Approximately three years.

Q. Before that where were you? A. I was in the Battle Creek, Michigan, plant.

Q. What was your position there? A. Manager of the Battle Creek plant of the same company.

The Court: That is the International Printing (304) Ink Company, and that is a subsidiary of the plaintiff?

Mr. Byerly: It is really a division of it. It is really the same corporation, acting under a different name.

Q. How long were you manager of the plaintiff's Battle Creek plant? A. About 14 years.

Q. While you were there did you sell any printing ink containing butyl carbitol to the Kalamazoo Vegetable Parchment Company? A. Yes.

Q. I show you a set of invoices produced by Mr. Hayward of that company and marked Plaintiff's Exhibit 29; do you recognize these invoices? A. Yes, I do.

Q. Are those invoices for ink sold by your company to the Kalamazoo Vegetable Parchment Company? A. That is right.

Q. Is the ink referred to in your invoices, or was the ink referred to in those invoices actually delivered? A. Yes.

Q. What is the period covered by those invoices? A. The period covered by those invoices is from December 19, 1933, to February 29, 1936.

Q. Did you have charge of the manufacture of the ink referred to in those invoices? A. Yes, I did.

Q. I notice the various inks on the invoices are referred to by numbers or symbols; what do they indicate? (305) A. The symbols indicate our formula numbers as they are recorded in the factory, as an identification of each individual formula.

Q. Were the inks which you sold and which were referred to in the invoices, made in accordance with these formulae referred to by numbers? A. That is correct.

Q. Have you made a summary or recapitulation of these invoices? A. Yes.

Q. Is this it? A. This is it.

Q. What is the total quantity of ink covered by these invoices? A. 36,060½ pounds.

Q. What is the total price? A. $20,143.30.

Q. Did you maintain formula books in your office showing the formulae of the inks you manufactured? A. That is correct.

Q. Have you produced here these formula books? A. Yes.

The Court: What do the formula books show?

Mr. Byerly: The composition of these inks that are referred to on the invoices, identified by the same numbers, and, of course, the books themselves contain a number of other inks.

The Court: They show the composition of each particular invoice of ink?

(306) Mr. Byerly: Yes.

Q. Have you made copies of the invoices in your invoice books which relate to the particular inks mentioned on the invoices, Exhibit 29? A. Yes.

Q. Are these the copies of the invoices which I now show you? A. Yes, these are the copies.

Q. Are they correct copies of formulae? A. Correct copies of the formulae that are in the formula books.

Mr. Byerly: To avoid the necessity of offering the entire books, I will offer these copies of the relevant formulas, and ask that they be marked in evidence.

The Court: Is there any objection?

Mr. Free: I do not think it is material. It is cumulative. It does not show very much. Let the witness describe what they are and that ought to be enough.

The Court: If there is no objection they will be admitted.

(Marked Plaintiff's Exhibit 31.)

Q. I notice the first formula in Exhibit 31 is identified as MX-1798, and that this symbol MX-1798 occurs as an ingre-

dient in a number of the other formulae, is that correct? A. Correct.

Q. What was the substance referred to as MX-1798? (307) A. This is a vehicle constructed from butyl carbitol and nitrocellulose that was used as the vehicle ingredient for the formula for the inks—for all of the inks, butyl carbitol and nitrocellulose.

Q. I notice in your actual formula book in which you made the copy which is part of Exhibit 31, the words "butyl carbitol" and "nitrocellulose" occur, is that correct? A. That is correct.

Q. And over the words "butyl carbitol" is written, apparently in pencil, "O-350". What is the significance of that figure? A. When we first started this type of formulation butyl carbitol was at that time first used in any production inks in our plant and it had not been through our routine procedure of serialization. At a later date butyl carbitol was serialized by our Brooklyn laboratory which handles the serialization of raw materials as O-350 and the O-350 was written in longhand there at a later date.

Q. A number of these formulae contained in Exhibit 31 have as an ingredient the symbol O-350. What does that indicate? A. That indicates butyl carbitol.

Q. Then as I understand it all the inks referred to in this invoice, Plaintiff's Exhibit 19, contain butyl carbitol? A. That is correct.

Q. That was the solvent used, was it? A. That was the (308) solvent, yes.

Q. What was the function of the nitrocellulose? A. The nitrocellulose was the solids part of the vehicle. In other words, the vehicle is composed to make any ink of that nature, and you have to have a resin and a solvent, so the nitrocellulose was the resinous part and the butyl carbitol was the solvent part.

Q. Did you ever see these butyl carbitol inks mentioned in the invoices in actual use at the plant of the Kalamazoo Vegetable Parchment Company? A. Yes, innumerable times.

Q. What sort of a printing press or presses were they used on? A. Why, they were run on two and four-color Kidder rotary presses, that is, some of the presses were two-color presses and some of them were four-color Kidder rotary presses.

Q. Those presses printed from a printing cylinder, a rotary cylinder? A. That is right, a rotary cylinder.

Q. They printed on a traveling web of paper? A. Printed on a traveling web.

Q. And did they have the usual ink distribution system, that is, a series of rollers to take the ink out of the tank or fountain or trough, as you call it, and apply it to the printing cylinder? A. That is right.

Q. What happened to the web of paper after it had been printed on? A. After it was printed the web of (309) paper was passed over the hot drum that was heated by steam and in turn there was sufficient heat to vaporize the solvent, and then the web went into a rewind and rolled up again into another roll after it had been through the press and over the heater.

Q. Have you ever seen presses of that type, or perhaps those same presses, used in printing with ordinary linseed oil inks? A. Yes.

Q. What happens to the web in those presses after it is contacted with the printing cylinder when linseed oil inks are used? A. Well, in that particular operation, after the web leaves the printing cylinders it passes over a wax bath which is carried upon a roller and applies a thin film of wax to the back of the sheet, which is then chilled and then it is rewound, with naturally the wax being on the back of the sheet preventing sticking and offset of the ink from the print of the sheet to the back of the succeeding sheet as it is wrapped around.

The Court: And that wax won't expose the ink?

The Witness: No, it won't. As a matter of fact, as the ink dries it dries away from the wax into the

paper and as it becomes a solid film it really releases from the wax and is clean on there because you might say it sticks tighter to the paper than to the wax.

(310) Q. The purpose of the wax film there is to keep the ink from coming off? A. Yes.

Q. Before it gets dry? A. That is right.

Q. Preventing it from coming off the paper? A. Yes, and also to eliminate sticking of the roll together.

The Court: Is that wax very thick?

The Witness: No, it is a comparatively thin film.

The Court: It is absorbed into the paper or stands out?

The Witness: No, it stands out on top. That is the reason for chilling it immediately after it is applied, so it sets that wax right on top of the paper and prevents any excess penetration or absorption.

Q. How long does it take these linseed oil inks to dry when they were on a web of paper that was rolled up this way with wax separating the different turns of the roll? A. Well, it depends entirely on the size of the roll and the amount of ink on the form. By the "amount of ink on the form" I mean whether it is a great big solid coverage of ink or whether it is just some light lines or type printing.

Q. Well, can you give us an idea whether it is a matter of seconds or minutes or hours or days? A. Well, with that type of operation it is all the way from two (311) days to two weeks.

Q. When you saw the butyl carbitol inks which you sold to the Kalamazoo Vegetable Parchment Company used on these presses, was this film of wax used to separate the turns of the roll when the printed matter was rolled up? A. No, that was not used.

The Court: As I understand it the web was run through and printed and then when it was wound up

it would be wound up with this other web of wax paper?

The Witness: No, that is not right. It is the same web but the wax is being applied—the printing is on the front of the paper.

The Court: Wax is on the back of the same paper?

The Witness: And the wax is applied on the back side of the same sheet.

The Court: And then it wound up until it is dry?

The Witness: That is right.

The Court: And then run off again and printed on the other side?

The Witness: No, that is very seldom printed on two sides, work of that type. It is usually waxed and a finished bread wrapper or a carton paper is made out of it.

(312) Q. When these butyl carbitol inks were used on those same presses did they apply this wax to the back of the web? A. No, that was not applied.

Q. What prevented the ink from sticking the turns of the web together when it was rolled up in this roll? A. Because it was dry when it went into the rewind.

Q. It dried as it passed over the steam cylinder to which you have referred? A. That is right. It was completely dry so that the form was dry when it went into the rewind.

Q. How long did it take that ink to dry? A. It was dry in a matter of seconds.

The Court: At what step in the operation was this heat applied, as soon as it came off the roll?

The Witness: Immediately after it comes off the printing cylinder. Then it is carried over a space of two feet over this drum, heating drum, and then within another three or four feet it goes right into the rewind.

The Court: Then it was not dry enough but what you needed the waxing?

The Witness: No, the wax was not used because it was completely dry.

The Court: Oh, I see; just an alternative proposition.

(313) Q. And in this case you say the ink was completely dry when it went into the rewind so it did not blot off from one turn of the rewind onto the other? A. That is correct.

Q. And in that case I suppose the web could be unwound and used right away without waiting a couple of days for drying as you did with the linseed oil? A. It could be immediately.

Q. Were these inks—

The Court: Is that drier used irrespective of the kind of ink you used, that heating?

The Witness: No. The heat was only used with the butyl carbitol-nitrocellulose type inks such as we have referred to. There is no advantage in using it with the other type inks, ordinary type oil inks.

The Court: Why not?

The Witness: Because the heat would have practically no effect on the drying, because the drying took all the way from two days to two weeks and there was no volatile solvent in there to evaporate. They dried completely by oxidation.

The Court: In other words you could not use a heater to dry out the linseed oil, then?

The Witness: It might increase the drying a bit and make the difference in drying maybe, instead of from (314) three days to two weeks, maybe from two days to ten days, something like that; but no material increase in drying.

Q. When did you first see a printing press running with an ink which dried in a matter of a few seconds as dis-

tinguished from several hours or a day? A. Oh, it was some time in the Fall of 1933.

Q. Was it before the date of the first sale mentioned in these invoices, which I think is December 19, 1933? I am referring to the invoices, Plaintiff's Exhibit 29 (handing to witness). A. Yes, I would say it is probably a couple or three months previous to that.

Q. Where was it that you first saw an ink which dried in a few seconds? A. Kalamazoo Vegetable Parchment Company.

Q. Was it being used on a press of the type which you have described? A. That is correct.

Q. Did you show any particular interest in this ink when you first saw it? A. Yes. I was naturally very enthused about it because from the common means of drying ink it was quite a new attack and a bit revolutionary.

Q. Did you get a sample of this ink? A. Yes. We received a sample of the ink I think about a month or six weeks after I initially saw it run.

(315) The Court: How long did they continue to use it?

The Witness: Well, I really couldn't say. I was not in the plant daily but I know that they made a number of runs with the ink, or I assume they did.

The Court: I mean, did they have it as a regular practice?

The Witness: No, I don't think they did at that time. Particularly the run that I saw was experimental.

Q. Did you ascertain from whom or did they tell you from whom they got this ink that dried so quickly? A. I don't believe that I personally knew just at that time whom it was obtained from.

The Court: It was from his company, wasn't it?

Mr. Byerly: No, it was obtained from Mr. Detrick

who testified here yesterday. It was obtained from Mr. Detrick, who testified he obtained ink varnishes from Dr. Gessler and took them out to Kalamazoo and had them tried out there. That was the Manufacturers Printing Ink Company that Mr. Detrick was with, your Honor will remember, and he had no connection whatever with the plaintiff. Of course at that time, your Honor——

The Court: He testified he got an order for the ink.

Mr. Byerly: Yes, he did.

(316) Mr. Free: I think it was 200 pounds and there was no re-order.

Mr. Byerly: That is right.

The Court: And he said he did not get ink from Gessler. He just got some varnishes.

Mr. Byerly: Got the ink varnishes from Dr. Gessler.

The Court: And he made it up.

Mr. Byerly: He and Mr. Stratton put these pigments in the varnishes and made the ink up from Dr. Gessler's varnishes, and took it out to Kalamazoo; when he got out there this witness, Mr. Jeuck, said he saw it running but did not know where it came from.

Mr. Free: You remember Mr. Stratton and Mr. Detrick said it took them several months to make the ink out of the varnish, and that was the same ink.

Q. When you got a sample of this ink did you find out what the ink contained? A. Yes. We were furnished a sample and an additional sample was sent to our New York laboratory and between us we ascertained that the vehicle in the ink was made from butyl carbitol and nitrocellulose.

Q. Did you ascertain that before you made the ink vehicle referred to on the first formula card? A. Yes.

Q. In Exhibit 31? A. Yes.

(317) The Court: I do not know if there is any testimony as to where the butyl carbitol came from. Did Mr. Detrick supply that or did Dr. Gessler supply it to Mr. Detrick?

Mr. Byerly: Dr. Gessler supplied it to Mr. Detrick.

The Court: Well, he got the varnish. Did that include the butyl carbitol?

Mr. Byerly: That included the butyl carbitol.

Q. Mr. Jeuck, when you have what is known as an ink varnish what is necessary to do to make an ink? A. Well, the vehicle is combined with pigments and the selection of pigments depended on the color that you have to match and the body of the ink adjusted so that it fits the particular paper and press on which you have to run it.

The Court: How heavy was this ink? Was it thick or thin?

The Witness: Well, this was quite a viscous ink, of a normal printing ink body.

The Court: What do you mean by "quite viscous"? Quite heavy or light?

The Witness: Well, very molassesy. Would that explain it a bit?

The Court: Yes. It wouldn't run very easy?

The Witness: No.

(318) Q. Is this work of making inks when you are supplied with the so-called ink varnish, a difficult task, Mr. Jeuck? A. I think if you have the normal art and experience of an ink maker, no, it is not difficult—a color matcher and an ink maker.

Q. Is this work of mixing up the pigment and the varnish so as to get the right color and consistency something that was done for the first time when you got these butyl

carbitol and nitrocellulose varnishes? A. No, the same thing is always done with linseed and oxidizing oils.

Q. And this question of mixing the pigment with the vehicle and the adjusting of the consistencies, as I call it, of the ink, is something in which an ink maker has to be skilled, is it not? A. Yes, he has to be skilled and experienced, but it is a normal procedure with most any vehicle that you might use.

Q. Just to illustrate to the Court, I have here a sample of butyl carbitol ink, Plaintiff's Exhibit 10: I do not know whether or not that was the same consistency of what you sold, but perhaps by showing that to the Court you can give him an idea of the consistency of these inks.

The Court: This is Exhibit 10?

Mr. Byerly: Yes.

(319) A. This is the average, normal consistency of an ink of this character.

The Court: That is the condition it is in when it is picked up by the rollers?

The Witness: That is right, once in a while it has to be a little heavier or softer, depending on the sheet of paper, but not a wide variation from that. In an ink like this you would add a little additional solvent, a little butyl carbitol, to make it softer. That would be the normal procedure.

Q. Did you ever receive any solvent known as butyl carbitol acetate at your factory in Battle Creek? A. Yes, we did, and I think that was in about, oh, the latter part of 1936.

The Court: You say you received any or did you make any?

Mr. Byerly: Received any. That is the basic material.

The Witness: You refer to butyl carbitol acetate in that question?

Q. Right. Incidentally, we might perhaps state where you obtained the butyl carbitol which you used in these inks mentioned on Exhibit 29. A. From Carbide & Carbon.

Q. That is, you simply bought it from the Carbide & (320) Carbon Chemical Company? A. That is right.

The Court: Where did you get the formulae?

The Witness: We analyzed the formulae from these samples that we obtained from the Kalamazoo Vegetable Parchment Company.

The Court: You did not get it from your home office?

The Witness: No.

Mr. Free: I object to this line of testimony on the butyl carbitol acetate. That is a different substance from the substance described in the patent in suit. It is immaterial as to whether or not they used butyl carbitol acetate.

The Court: As I understand it, they abandoned butyl carbitol and went over to butyl carbitol acetate.

Mr. Byerly: That is not the fact.

The Court: I thought that was your theory.

Mr. Byerly: No, sir, that is Mr. Free's theory, and it is to meet that that some of this testimony is being put in.

The Court: You are rather anticipating this defense then.

Mr. Free: Yes, sir, all the way through this testimony. That is why I raised the question.

Mr. Byerly: Mr. Free raised the alleged failure (321) of butyl carbitol, as bearing on the question of infringement. I do not think it does.

The Court: You make it clear after I have heard the other side and we are up to rebuttal on that.

Mr. Byerly: What we are trying to bring out, so as not to make this by argument but by facts, is that we are selling butyl carbitol inks today and they are working perfectly, so there has been no abandonment

whatever. I think that bears on the question of infringement probably as well as validity.

The Court: Go ahead.

Q. You said that at your factory in Battle Creek you did get some butyl carbitol acetate, when did you say, about 1936? A. In the Fall of 1936.

Q. Where did you get it from? A. That came from our New York laboratories.

Q. Did you make up some of the inks using butyl carbitol acetate as a solvent? A. Yes, we did.

Q. Did you deliver some samples of those inks to the Kalamazoo Vegetable Parchment Company? A. That is correct.

Q. Did you personally observe and compare the printing operation when carried on with butyl carbitol inks and butyl carbitol acetate inks at the plant of the Kalamazoo Vegetable Parchment Company? A. Yes.

Q. What kind of ink rollers were used in the presses (322) in which you observed these two inks? A. There were two types of rollers used. There were rubber rollers used on some of the equipment and on the other equipment there was what is considered a processed roller, which is a roller that is made with a rubber base and then coated with a thin coating of glue-glycerine roller composition. It gives your printing surface exactly the same type of roller as with a straight, solid glue-glycerine roller.

Q. When you observed the action of these two inks when printed with rubber rollers, what difference did you notice in the two inks? A. No difference.

Q. There was no difference in the stability of the inks on the rollers? A. No.

Q. There was no difference in the speed at which the inks dried? A. No.

Q. There was no difference in the effect of the inks on the rollers? A. That is correct.

Q. When you saw these two inks printed on presses with these rollers that were coated with the glycerine composition, did you notice any difference in the rate at which the two inks dried? A. No difference in the rate at which they dried, no.

The Court: Between the acetate and the butyl carbitol?

(323) Mr. Byerly: Yes.

Q. Did you notice any difference in the stability of the inks, the softness of the inks, on the rollers of the press? A. No.

Q. What, if any, difference did you notice in the action of the ink on the rollers themselves? A. Ordinarily after you ran the butyl carbitol inks approximately a week it would be necessary to recoat the rollers on account of the cracking effect of the butyl carbitol on the glue-glycerine coating, and with the butyl carbitol acetate inks I would say that the rollers would stand up for a period of three weeks, which was quite comparable as the effect with oil inks.

Q. Did you sell any substantial amount of ink containing butyl carbitol acetate as the solvent to the Kalamazoo Vegetable Parchment Company? A. Very, very little, because it was just about that time that they started in their own manufacture of the ink of this type.

The Court: They started to make their own ink?

The Witness: That is right.

The Court: What did they make, an acetate or butyl carbitol?

The Witness: I would not know.

Q. Mr. Hayward referred in his deposition to what (324) he called a Vapo-Set ink, which he said he had used to some extent after he had used these heat-dried inks; is Vapo-Set the name under which an ink is sold by your company? A. That is right.

Q. Are you familiar personally with the making and use of the inks which are called Vapo-Set? A. Yes.

Q. Will you tell us what the inks are made of and how they are used, very briefly? A. Vapo-Set inks are basically constructed with a very hygroscopic solvent. Diethylene glycol is a very important one, in conjunction with a resin, and in all instances to my knowledge a stabilizer has to be added to keep the ink from drying and precipitating on the press due to the hygroscopic properties of the solvent.

Q. How are they dried on the paper? A. They are dried on the paper by either the application of a spray or moisture, or water spray on there, or a spray of steam, and in turn the steam or moisture is taken out by the hygroscopic solvent, and it is diluted to a point where the resin is no longer soluble in the mixture of solvent and water, and the resin precipitates out, leaving a comparatively dry film.

Q. Why is it that this does not occur on the printing rolls of the press when the air in the printing room is moist? A. Because we would normally add stabilizing (325) ingredients to the ink to decrease its moisture sensitivity because without that, the moisture in the air would precipitate the resin out on the press, you could not print in turn.

The Court: Vapo-Set ink restores moisture?

The Witness: Very easily.

The Court: That comes off on the press or is precipitated on that?

The Witness: That combines with the solvent and then after it has absorbed a certain amount of moisture the resin is no longer soluble, and the resin precipitates out and gives you a solid film, dry film.

Q. I am not sure you made clear to the Court why that does not happen on the printing rollers of the press. That is, what you have referred to is the resin coming out in

the use of this ink is something that happens after the ink has been printed on the paper? A. That is right.

Q. Will you state again why the same thing does not happen on the rollers? A. The same thing does not happen on the rollers because we add stabilizing material to the ink, which decrease the water sensitivity of the ink to the moisture in the air and prevents the precipitation of the resin from purely the moisture that it contains or is in the air and that it pulls out of the air.

Q. But a hygroscopic solvent and an ordinary (326) resin alone would make an ink that could not be used? A. To my knowledge it could not.

Q. And that is because it would not be stable on the press? A. That is correct.

Q. Did you ever note any instability of the press in the case of an ink containing butyl carbitol as the solvent? A. No, I have not.

Q. Mr. Hayward also mentioned one other kind of ink which he called an aniline ink; will you tell us very briefly if you know what an aniline ink is and how it is used? A. An aniline ink is a resinous solvent type ink, usually made with very low-boiling solvents. Alcohol is one of the important solvents. It is quite thin in viscosity and watery, and it is applied from a press and printed from a rubber plate, and there is no distributing mechanism on the machine that is similar at all to an ordinary letter press. I think probably an explanation in the layman's language is you may say it is a rotary rubber stamp printing.

Q. Could these aniline inks be used in an ordinary printing press? A. No, they are entirely too volatile.

Cross examination by Mr. Free:

Q. I am not sure I understood you correctly. I think you said, didn't you, that the heat-set ink containing butyl carbitol that you sold over a period of about three (327) years to Kalamazoo was about 30,000 pounds? A. That is correct.

Q. You were sitting here yesterday when Mr. Hayward's testimony was read, were you not? A. That is correct.

Q. Do you remember that one of the questions was something like this—I asked him how many pounds of ink he sold a month and he said, "We use sixty or seventy thousand pounds a month"; do you remember that?

Mr. Byerly: I think this is a matter of argument and not cross examination of this witness, as to what Mr. Hayward said. He is asking him about how many total pounds of ink——

The Court: Mr. Hayward did testify to that.

Mr. Byerly: Yes, but I cannot see that that is cross examination of this witness.

The Court: I think it is proper.

Q. So the amount of ink you sold him over a period of three years was about half his consumption per month, roughly? A. It would be on that basis.

Q. Then I asked him this question, "What proportion of that amount is this heat-set ink which you have been buying from I.P.I.?" And he answered, "Only a fraction of one per cent." Do you remember that? A. That is right.

Q. That is in accordance with your understanding of (328) your sales too? A. That was not in accordance with my understanding of the sales during that period. I think you will find there is a period of possibly a year in here when this type of ink was of a very much greater percentage of the sales, but you are entirely correct that over a period of a number of years in there that that is correct.

Q. Butyl carbitol varnish, as I understand it, is a solution of nitrocellulose in butyl carbitol, isn't it? A. That is right.

Q. Do you know how they make that? A. Yes, we have made a lot of it.

Q. You merely stir in nitrocellulose in butyl carbitol, isn't that right? A. Yes.

Q. There is no trick at all in it? A. Not from a manufacturing standpoint.

Q. You just take the nitrocellulose, put it in the butyl carbitol and stir it? A. It will go in in a period of time and you have a complete solution.

Q. As I understand it, this heat-set ink we have been talking about is substantially like the old varnish ink, excepting that the butyl carbitol-nitrocellulose varnish is substituted for the linseed? A. That is correct, which replaces the linseed or any other drying oils that might have been used as a total vehicle.

(329) Q. And the pigments are the same and all the other elements are the same? A. Basically the same, yes.

Q. You do not mean to tell us that these heat-set inks have entirely replaced linseed varnish inks? A. Absolutely not.

Q. The amount of linseed varnish ink still sold is far in excess of the heat-set ink? A. Yes, I would say it is by far greater proportion.

Q. How much ink is sold per year in the entire industry, have you any idea, all kinds of ink? A. Pounds or dollars and cents?

Q. Or carloads. A. No, I have not.

Q. It is a matter of carloads, isn't it? A. Yes.

Q. Let us take your office, how much ink do you sell a year of all kinds, in pounds or carloads? A. Are you speaking of our individual factory or our factories in general?

Q. Tell me what you know, and identify the factory and company. A. I will identify the factory. The records would be more exact. We will make ten million pounds of ink a year in the Chicago factory, that is, exclusive of news ink.

Q. Why do you exclude that? A. Because it is an entirely different type of ink, made from non-drying oils.

(330) Q. I will ask you the question as to all inks. A. If we were to include that, we will put in another ten million.

Q. What does that amount to in dollars roughly? A. $3,500,000 or $4,000,000.

Q. I think you mentioned gravure inks and, as I understand it, those inks are applied to paper.

Mr. Byerly: If your Honor pleases, this witness did not mention gravure inks, unless I am mistaken, but if Mr. Free wishes to make him his own witness on that subject I have no objection.

The Court: All right.

Q. Did you mention gravure inks at the Kalamazoo Vegetable Parchment Company? A. No.

Q. You know how they work gravure inks? A. I know the principle.

Q. And those inks are applied to the paper and then heat is applied to the paper? A. That is right.

Q. And the solvent evaporates? A. That is correct.

Q. And then when the paper comes off the press the ink is dry? A. That is correct.

Q. And they use that for printing magazines and all sorts of things? A. It is used to a great extent, not to the degree that letter press printing is, though.

The Court: What is letter press printing?

(331) The Witness: Letter press printing is printed from a raised plate and gravure is printed from an etched setup.

The Court: That is the only difference?

The Witness: That is right.

Q. Gravure is sometimes called negative printing and letter press is sometimes called positive printing? A. That is true.

Q. That describes it pretty well? A. Yes.

Q. These glue-glycerine coated rollers, aren't they rubber rollers with a thin coating of glue-glycerine on? A. Yes, they have a rubber base with a thin coating of glue-

glycerine on. As far as the printing surface being affected by ink, it is the same as being solid with glycerine, fundamentally.

Q. It is about 1/16th of an inch thick on the rubber? A. Yes.

Q. They apply that by painting it on? A. There is a special machine that pours it on,—coats it.

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(332) HERBERT F. SMITH, called as a witness on behalf of the plaintiff, being duly sworn, testified as follows:

Direct examination by Mr. Watson:

Q. Where do you live? A. Battle Creek.

Q. What is your occupation? A. Manager of the Battle Creek factory of International Printing Ink.

Q. How long have you held that position? A. Since 1940.

Q. Previous to that where were you employed? A. Battle Creek.

Q. In what capacity? A. Sales.

Q. Had you anything to do with manufacturing before you became in charge of the factory? A. Assistant to Mr. Jeuck, the witness who just testified.

Q. I show you a group of invoices, Plaintiff's Exhibit 30, which were identified by Mr. Hayward; do you recognize them? A. I do.

Q. What are they? A. They are heat-set ink shipments we made to Kalamazoo Vegetable Parchment Company and were covered by Kalamazoo Vegetable Parchment Company's bona fide orders.

Q. Have you ascertained the total number of pounds of such ink represented by those invoices? A. Yes, I have that. May I refer to it?

(333) Q. Surely. A. 38,579 pounds.

Q. What price was received for those inks? A. $30,115.73.

Q. Can you tell us what period is covered by those invoices? A. Yes, from August 12, 1936 to November 18, 1942.

Q. Those invoices refer to code numbers? A. You mean they are referred to as a code number?

Q. Isn't there a code number mentioned in connection with each? A. That is right.

Q. Can you tell me what those code numbers are? A. They are the identification numbers we have on the formulas that are in those books. After they are copied they are recorded under a number.

Q. Are the inks made in accordance with the formulae referred to by such code numbers? A. Yes.

Q. Can you produce copies of the formulae referred to in these invoices? A. Yes, I can.

Q. You have produced such copies? A. The first one is right here, MX-3858 and MX-3859.

Mr. Watson: I offer these copies in evidence.

(Marked Plaintiff's Exhibit 32.)

The Court: That is a summary of the invoices?

Mr. Watson: No, a copy of the formulae used in compounding these inks.

(334) Q. Would you please refer to these formulae and tell me what code number identifies the varnish used? A. K-484.

Q. What is that varnish, do you know? A. Butyl carbitol and nitrocellulose.

Q. What code number refers to the solvent, if any, used in addition to the varnish? A. O-360.

Q. What is O-360, do you know? A. Butyl carbitol acetate.

Q. Where did you obtain the varnish K-484, Mr. Smith? A. From the Ault & Wiborg Company of Cincinnati.

Q. You personally did not compound that? A. No.

Q. Tell us what you did with it? A. We used K-484 as a vehicle for making these heat-dried inks in the same capacity that we would use linseed oil varnish for making linseed oil inks.

Q. You add to that pigments? A. That is right.

Q. And various compounds and some additional solvent as a thinner? A. That is right.

Q. The additional solvent that you added was the O-360? A. That is right.

Q. You say that is butyl carbitol acetate? A. Yes, sir.

Q. Why did you add butyl carbitol acetate as a thinner, if you were informed that your varnish had butyl carbitol as a solvent? A. We did not have any (335) butyl carbitol. It was not available.

The Court: Was acetate used in all those formulas?

Mr. Watson: No, your Honor. I will bring that out.

Q. I notice that in the first three formulae you have here, namely, MX-3421, MX-3422 and MX-3423, there is no reference to K-484 or to O-360, is that correct? A. That is correct, yes. This was a small shipment of ink made to the Kalamazoo Vegetable Parchment Company for proving purposes.

Q. Can you tell me which invoice those three formulae related to? A. Invoice No. 17,752.

Q. That is for nine pounds of one color? A. 4¾ of another and 4¾ of another one.

Q. For what purpose was that ink used, for proving purposes? A. Yes, in other words, the Kalamazoo Vegetable Parchment Company were asked by their customer to submit proofs of what the finished job would look like. We could not furnish heat-set ink because they did not have any heating unit to dry the heat-set ink on their proving press, so it was necessary for them to use oil base inks in making the proofs.

Q. The initial invoice, the first one in period of time, does not relate to heat-set ink? A. No.

(335a) Q. I notice also that one of these formulae refers to nitrocellulose and O-360 and bears No. M-21773; can you tell me what that is? A. A varnish we made in the Battle Creek factory. It is a cold cut of nitrocellulose with butyl carbitol acetate.

(336) Q. Some of the ink formulae also refer to the No. M-21773, do they not? A. That is right.

Q. That means that the varnish used in inks made in accordance with that formula was the M-21773 type? A. Correct.

Mr. Free: Your Honor, I again object to all this testimony about butyl carbitol acetate. These invoices seem to be all mixed up, some butyl carbitol and some butyl carbitol acetate. That which has to do with butyl carbitol acetate is immaterial and irrelevant here. The patent in suit is butyl carbitol. They have another patent on butyl carbitol acetate which is not in suit here.

Mr. Watson: If counsel will be patient I will connect it up.

The Court: You will what?

Mr. Watson: I say, if counsel will be patient I will connect it up.

The Court: All right. We will rely upon you for that.

Q. Mr. Smith, you heard Mr. Blackmore testify yesterday that the K-484 varnish was made of butyl carbitol and nitrocellulose? A. I did.

Q. He introduced in evidence the formula cards for those varnishes, did he not (handing to witness)? (337) A. Yes, sir.

Q. Have you examined those formula cards and your own formula cards and determined the ratio of butyl car-

bitol to butyl carbitol acetate in the inks covered by the group of invocies, Plaintiff's Exhibit 30?

Mr. Free: I do not believe he knows anything about these Blackmore invoices, and he cannot testify about them.

The Court: If he doesn't know he can say so.

Mr. Free: Have you ever seen these before?

The Witness: I saw them this morning, yes: I heard about them in the testimony yesterday, and in getting the proportion of butyl carbitol and nitrocellulose and butyl carbitol acetate I had some information.

Mr. Free: But you never saw these before and do not know anything about them?

The Witness: Not until I saw them this morning, to get the figures.

Mr. Free: I think it is immaterial, your Honor. What he is doing is comparing something and anyone can do that. It does not help us any.

The Court: Well, it might be interesting.

Mr. Watson: I think it might be somewhat helpful if the ratios could be stated instead of calculated in briefs; I mean, it is all a matter that can be done (338) arithmetically.

The Court: All right.

Q. Can you tell me the range of the ratios?

The Court: What you want to know is which of which and how many of one made up all those 38,000 pounds?

Mr. Watson: All I was going to bring out here was the ratio of butyl carbitol to butyl carbitol acetate in these 38,000 pounds. For instance——

The Court: Well, they are both heat-setting inks, aren't they?

Mr. Watson: Yes, sir.

Q. How many parts of butyl carbitol to one part of butyl carbitol acetate did you determine to be contained in the inks made in accordance with these formulas? A. It ranged from about 4 parts to 30 parts of butyl carbitol to one part of butyl carbitol acetate.

The Court: You mean in the same composition?

The Witness: Yes.

Mr. Watson: That is, it might be made clearer if you will look at these formulae.

The Court: You need not take this down.

(Discusion off the record.)

The Court: All right, go ahead.

Q. Did you find the addition of a small amount of butyl carbitol acetate to these butyl carbitol inks made (339) any difference in their behavior? A. Not at all.

Mr. Watson: All right, Mr. Free.

Cross examination by Mr. Free:

Q. How did you find that out? Print with them? A. Oh, sure.

Q. Still, as I understand it, some of these 30,000 pounds of ink we have been talking about contains a mixture of butyl carbitol and butyl carbitol acetate? A. There was a small percentage of butyl carbitol acetate put in as a thinner. The ink was too heavy a consistency to work well on the press, and we cut it down a little bit with 0-360.

Q. Did that mix well together, butyl carbitol and butyl carbitol acetate? A. Yes, sir.

Mr. Free: That is all.

Mr. Watson: That is all, Mr. Smith.

Mr. Byerly: If your Honor pleases, I will conclude my case by having a portion of a deposition taken

by the plaintiff read. This was given by a user who has used both the plaintiff's and the defendant's inks in his commercial printing.

The Court: We will take a recess of ten minutes.

(Short recess.)

Mr. Watson: If your Honor pleases, I would like (340) to read a portion of the deposition given by Peter Dennerlein, which deposition bears on the question of infringement, reserving the right——

The Court: Isn't this properly rebuttal?

Mr. Watson: No, not on infringement, your Honor.

Mr. Free: This is all commercial success as far as I can make out and is rebuttal.

Mr. Watson: I am confining myself to the portions of the deposition in which he states that his company has used heat-set inks and that such inks have included inks purchased from the defendant.

The balance of the deposition, which relates to commercial success, we should like to offer in rebuttal, reserving the right to offer it in rebuttal if it meets with your approval.

The Court: They used heat-set inks?

Mr. Watson: Yes, sir.

The Court: Of the plaintiff?

Mr. Watson: Yes, sir, and of the defendant.

The Court: All right; proceed.

Extracts read in evidence from deposition of Peter Dennerlein, produced as a witness for plaintiff, who, being first duly sworn, deposed and said:

Direct examination by Mr. Watson:

Q. You are Mr. Peter Dennerlein? A. Yes.

Q. What is your occupation? A. Manufacturing (341) director of Crowell-Collier Publishing Company, Springfield, Ohio plant.

Q. Springfield, Ohio? A. Yes. My residence is 1616 Midvale Road, Springfield, Ohio.

Q. What is the business of the Crowell-Collier Publishing Company? A. Well, publishers of Collier's National Weekly; Woman's Home Companion, and the American Magazine. The main office is at 250 Park Avenue, New York City. Known as the Crowell-Collier Publishing Co. President is Thomas H. Beck; Second Vice-President, Albert E. Winger.

Q. Do they also print those magazines? A. All three magazines are printed in this plant?

Q. Yes? A. We have no other office or no other plant—manufacturing plant.

Q. Would you care to give us the circulation figures of those magazines? A. Yes; Collier's is three millions; Woman's Home Companion four millions and the American Magazine is 2,800,000; Collier's being a weekly and the American Magazine and Woman's Home Companion being monthly magazines. I have been connected with Crowell-Collier Publishing Company since June 29, 1937 in the same occupation; formerly with the McCall Corporation—assistant to W. S. Robinson. Their plant is located in Dayton, Ohio. I was with McCalls from (342) March, 1924 to June 19, 1937.

Mr. Watson: Now, your Honor, I would like to offer page 4, line 14 through the sentence ending in line 9 of page 5.

The Court: All right.

By Mr. Watson:

Q. What kind of ink do you use on your typographic presses? A. On the typographic presses we use two types of ink. One is known as an oil varnish vehicle, and the other a heat flash, or one containing a highly volatile solvent. On the oil type inks we use what is called a tympan sheet which acts as a blotter between the sheet printed on one side while

it comes in contact with the printing plates on the second side. This tympan paper or blotter prevents a major part of the smudging, but it is conducive to licking or taking some of the ink off the sheet after its first impression. This same oil varnish type ink usually takes from six to twelve hours to dry, and if an excessive amount of ink is used in printing it, the ink has a habit of offsetting on to the sheet printed previous or succeeding sheet when they get in contact, whereas the heat flash or solvent type inks either come in contact with a steam drum or pass through a gas oven manufactured by the Selas Manufacturing Co. of Philadelphia (343) and are dried. These flash inks were first used by McCall's some time in 1935 and furnished by the International Printing Ink Co. When I first came to Springfield the International Printing Ink Co. and the Levey Printing Ink Co. both were furnishing this type of heat flash inks.

* * * * * *

Q. These heat flash inks you mention and which you obtained from International Printing Ink Co. were being sold under the trade name of "Vaporin"? A. That is correct.

Q. And you have used them in this plant—throughout your employment here? A. Yes.

Q. And you still are using them? A. Yes.

* * * * * *

(344) Q. Are the heat flash inks that you have used stable on the press—that is, do they dry on the press as it operates or not? A. No, they do not dry on the press while it operates, but they will dry on the press if the press is idle too long with ink left on the rollers.

Q. Yes. A. And we have shut down presses 30 minutes, 45 minutes; in fact an hour without the ink actually drying out.

Q. And are those inks set or dried immediately on the application of heat? A. Oh, yes; they have to be. Yes, sir.

Q. Are you still obtaining inks from I. P. I.—that type of inks? A. Yes.

Q. Have you also obtained such inks from Sinclair & Carroll? A. Yes.

Q. Did they appear to you to be equally stable on the press and equally capable of being set immediately on the application of heat? A. Yes.

* * * * * * *

Cross examination by Mr. Free:

Q. You were buying Sinclair & Carroll inks in 1941? A. Yes, sir. If I remember correctly it was the latter (345) part of 1940. I don't know exactly. I can find it out if you want to know. I can check it.

Q. Not if you don't know about it yourself. A. It was right along in the latter part of 1940,—or '41. In there somewhere.

* * * * * * *

Re-direct examination by Mr. Watson:

Q. You said you purchased Sinclair and Carroll inks in 1940—the latter part of 1940? A. To the best of my recollection.

Q. First purchased then? A. Yes. I am not sure now.

Mr. Free: I object to that. He said he was not sure.

The Witness: I am not sure when we started buying heat-flash or "Vaporin" type inks from Sinclair & Carroll, but early, 1940, '41. Somewhere in there.

Q. You had been using heat-set inks for some time prior to that? A. Yes.

That is all I shall offer at this time, your Honor.

Mr. Byerly: Plaintiff rests.

* * * * * * *

(346) Mr. Free: May it please the Court, ordinarily at the close of the plaintiff's case a motion to dismiss is not in order, but in this instance I make it on the ground that the plaintiff has failed to prove infringement and I say that because the patent in suit is a very specific one. As we remember the claims—and I would like to invite your attention to claim 3 in particular of the patent in suit, states in the last clause, "the major part of the liquid component"—that is at line 32, the first column, and that has reference to the solvent—"having a vapor pressure which at 150 degrees Centigrade approximates that of ethyl alcohol at ordinary temperatures."

Now that clause is substantially the same in all of the remaining claims charged to infringe. What does he mean by that? We have to look at the specification for that, and at the bottom of the first column of page 2 there is a statement that the vapor pressure at 150 degrees of butyl carbitol is 60 (347) millimeters or 6 centimeters, and that the vapor pressure of ethyl alcohol, given at the top of the second column of page 2 is 40 millimeters or 4 centimeters. For my present purposes it is immaterial whether we take 40 or 60, but the claim is very specific in that it says the solvent—and they accuse our 5024 oil here of being the solvent which infringes in the ink—has a vapor pressure which at 150 degrees Centigrade approximates that of ethyl alcohol at ordinary temperature. That means our solvent must have a vapor pressure at 150 degrees which is equal or substantially equal to that of butyl carbitol, namely, 40 millimeters.

Now on Plaintiff's Exhibit 5, which is offered in evidence to indicate the vapor pressure of not

only butyl carbitol but also our 502-C oil, which is the last curve, you will notice that the vapor pressure of 502-C oil at 150 degrees Centigrade is 20 millimeters or 2 centimeters.

The Court: It is below that.

Mr. Free: Yes, about 19, say. That is less than half of ethyl alcohol vapor pressure at room temperature, which is 40. It is only one-third or less of the vapor pressure of butyl carbitol which is 60. The claims call for two points which the accused solvent must meet: First, it must have a vapor pressure at room temperature (348) which is as low as butyl carbitol, and ours is that low, but it also must have a vapor pressure at 150 degrees Centigrade which is at least as high as ethyl alcohol or butyl carbitol—either one. Now those are 40 and 60. It is true he uses the weasel word "approximately", but "approximately" does not mean one-third or one-half.

So I think the motion should be granted on the ground that having failed to prove its one point that it had to prove in its *prima facie* case, namely, that the defendant infringed the patent in suit, the motion should be granted.

The other two points that the plaintiff has been called upon to show here are title to the patent, which we admit, and jurisdiction of this Court which we also admit. Of those three things he has failed to prove the third necessary one, and that is infringement. So I bring this motion under Rule 41(b), which in order to refresh our recollection I might read. It is entitled:

"Involuntary Dismissal: Effect Thereof. For failure of the plaintiff to prosecute or to comply with these rules or any order of court, a defendant may move for dismissal of an action or of any claim against him. After the plaintiff has completed the (349) presentation of his evidence, the defendant,

without waiving his right to offer evidence in the event the motion is not granted, may move for a dismissal on the ground that upon the facts and the law the plaintiff has shown no right to relief. Unless the court in its order for dismissal otherwise specifies, a dismissal under this subdivision and any dismissal not provided for in this rule, other than a dismissal for lack of jurisdiction or for improper venue, operates as an adjudication upon the merits."

Mr. Byerly: I concede, of course, that if we have not proved infringement the case should be dismissed, but I think it has been proved very wholly because the patent expressly uses the word "approximates" with a view to giving a sufficiently definite indication so that anybody can tell what to use in order to get the same results which the patent specifies; and the patent, you will remember, calls attention to a particular class of solvents in which the vapor pressure rises very much when heated above a hundred degrees Centigrade, and then gives ethyl alcohol as illustrating a highly volatile liquid. It mentions its vapor pressure and says that the vapor pressure of the solvent used in the ink at 150 degrees must approximate that of ethyl (350) alcohol, which means, of course, that it must approximate it closely enough for the purposes in question, which purpose is making the ink dry quickly by having the solvent go out of it quickly, just the way ethyl alcohol does.

Now, to illustrate that we showed your Honor an ink which was actually made with ethyl alcohol and which your Honor may remember the witness drew down on a paper, and it dried instantly. We also showed another ink which was made up with a solvent, whose vapor pressure approximated that of ethyl alcohol. That solvent I think had a vapor pressure of about a centimeter and a half, according to the testimony; and your Honor observed that that

dried so quickly that one could scarcely see the difference. In fact, I do not think the difference was distinguishable.

Then in cross examination of Mr. Bragdon reference was made to the vapor pressure of water, which was said to be about a centimeter and a half, and Mr. Bragdon was asked to compare the rate of evaporation of water and ethyl alcohol. He said there was very little difference; they would both evaporate rapidly. In other words, the testimony shows and the patent itself shows that when you get this rapid increase in vapor pressure from an initial vapor pressure (351) at room temperature, amounting to a few hundredths of a millimeter, up to something in the order of a few centimeters, that you have accomplished what the patent specifies; and the only reason that the witness did not say in terms that the vapor pressure of its solvent approximated that of ethyl alcohol was because your Honor properly ruled that they could not use the exact words of the claim. But the testimony brought out very plainly that this solvent of the defendant with a vapor pressure of 150 degrees is about 2 centimeters; defendant's approximates that of ethyl alcohol. In fact, it approximates it just as closely as butyl carbitol does. Butyl carbitol is about 6 centimeters. Ethyl alcohol is about 4 centimeters, and the defendant's is about 2. They are each approximately the same as ethyl alcohol, and so far as the purposes and operations go they act exactly the same. So that any reasonable interpretation of the words in the patent necessarily include defendant's solvent and it would, of course, be permitting a mere evasion of the patent to say that a substance which has a vapor pressure such that it approximates ethyl alcohol and works exactly the same way in the ink as we have shown your Honor, is outside the scope of the claim.

And another point in the patent, which I think (352) is worth noticing, is that the patent indicates pretty clearly what is meant by "approximately", because it contrasts the solvent in question, the particular solvent that he used as an illustration, butyl carbitol, with another liquid called dibutylphthalate, which is used as a plasticizer, and which the patent points out does not evaporate when the ink is heated but merely stays in to soften the binder a little bit. And you will notice in the patent on page 2, lines 10 to 15 of the claim column, he points out that the vapor pressure of diethylene glycol monobutyl ether, which is butyl carbitol, indicates that it will evaporate instantaneously at elevated temperatures like ethyl alcohol at ordinary temperatures. He says that notwithstanding the fact that there is a 2 centimeter difference, as he has pointed out himself, that is, ethyl alcohol is 4 and butyl carbitol is 6. He says those vapor pressures indicate that they evaporate the same way, meaning that they are approximately the same, and then he contrasts that with a plasticizer, such as dibutylphthalate which will evaporate very slowly when heated to 150 degrees. And this Exhibit 5 I think brings that out very strikingly. Your Honor has seen it. But this substance, dibutylphthalate which he says will not evaporate, is down here about one millimeter (353) at 150 degrees. Clearly does not approximate ethyl alcohol. That is very much lower. And I think if this approximates this that all three of those are approximately the same, and the testimony has gone to the point of showing—this next to the last witness pointed out that the butyl carbitol acetate which was used in some of the inks as equivalent to butyl carbitol, that no difference could be observed in the action of the ink on the press. So that in itself shows these little differences between these curves do not make a

difference, and that is clearly within what the patent meant by "approximately".

The Court: The motion to dismiss will be denied, with exception.

DEFENDANT'S PROOFS.

Mr. Free: I would like to offer in evidence as Defendant's Exhibit E file wrapper of the patent in suit, which I offer for the purpose of showing at final argument and in the proofs that the plaintiff is estopped from stretching his claims to include claims previously relinquished, in accordance with the requirements of the Patent Office. And, secondly, to show that these claims are put into the case more than two years after the ink of this patent, butyl carbitol ink, was put in commercial use. Now, in the Muncie-Gear case announced by the Supreme Court not (354) long ago, they held that a claim of that nature was invalid by reason of having been put in too late. I won't go into the Muncie-Gear case now. I simply explain why I put this in as a defendant's exhibit.

(Marked Defendant's Exhibit E.)

Mr. Byerly: I shall not object to the exhibit, but I should like it understood that I do not think the exhibit supports either of those defenses, but, on the contrary, disproves them.

Mr. Free: I would also like to offer in evidence as Defendant's Exhibit F plaintiff's answers to interrogatories, and I offer all of them.

(Deemed marked Defendant's Exhibit F.).

Mr. Free: I might explain that Mr. Byerly and I agreed in behalf of these interrogatories to put the questions and the answers in the same paper so that they can be read more easily.

The Court: How long are they?

Offer of Exhibits.

Mr. Free: They are not very long. Would you like me to read them?

The Court: Yes.

(The interrogatories and answers were read to the Court.)

Mr. Free: I now offer in evidence as Defendant's Exhibit G the book of patents and publications (355) all named in the answer and the amendment to the answer, but this book does not include all of them. This exhibit contains a copy of Lefferts-Stevens patent No. 380,654, a copy of Doughty patent No. 1,439,696——

The Court: Are these all anticipations?

Mr. Free: Yes, I will classify them.

Copy of McElroy and Clarke patent No. 1,450,692.

Copy of Smith patent No. 1,752,462.

Copy of Clewell patent No. 1,806,965.

Copy of Bradley patent No. 1,884,553.

Copy of Lawrence patent No. 1,858,673.

Copy of Lawrence patent No. 1,954,450.

Copy of Jirousek patent No. 1,954,627.

The catalog, that is, the fly-leaf and pages 12 and 13 and the table of physical properties, in the Catalog of Carbide & Carbon Chemicals Corporation, Second Edition, January 1, 1929; a photostat from Industrial and Engineering Chemistry, a publication, issue of April 1931, page 17, entitled "Custom Built Solvents" by Carbide & Carbon Chemicals Corporation; and photostatic copies of pages 9 and 25 of Printing Equipment Engineer, issue of December 1931, entitled "Plastic Printing Inks for Rapid Drying."

In order to classify these patents I offer (356) Lefferts and Stevens, Doughty, McElroy and Clarke, Smith and Jirousek as anticipations. The remainder are offered as indicating the state of the art. I have the original copies of Industrial and Engineering

Chemistry here, if the plaintiff wants to inspect them, but I think we have agreed that photostatic pages can be substituted in each case.

Mr. Byerly: That stipulation is on file.

Mr. Free: One more thing. I have a photostatic copy of the whole catalog of Carbide & Carbon Chemicals Corporation, which is in this book, and the same applies to that, and I would like to ask the plaintiff if he will concede that that catalog has been distributed to the trade in substantial numbers.

Mr. Byerly: Which catalog is that?

Mr. Free: The catalog of the Carbide & Carbon Chemicals Corporation of 1929.

Mr. Byerly: I will concede it was distributed. I have no idea in what numbers.

Mr. Free: I can prove it, but the company said in excess of 1000, if you will take their word for it.

Mr. Byerly: If you will let me check that. I assume it is correct, but I have no information at all about it.

Mr. Free: Well, all right, let me know about (357) that.

(Marked Defendant's Exhibit G.)

Mr. Byerly: If your Honor pleases, I notice that he has added one patent to those which were set up in his bill of particulars as the patents on which he was to rely.

The Court: For anticipation.

Mr. Free: State of the art. I can offer it separately. It is part of the file wrapper, but I think I would like to have them all in that book.

Mr. Byerly: There is no objection. I just did not have a copy here.

Mr. Free: All the anticipation patents are set up in the answer and the bill of particulars.

(358) CLINTON TAYLOR, called as a witness on behalf of the defendant, being duly sworn, testified as follows:

Direct examination by Mr. Free:

Q. What is your occupation? A. Chemist.

Q. With what company? A. Hilton Davis Chemical Company.

Q. That is at Cincinnati, Ohio? A. That is correct.

Q. Prior to that you were in school? A. That is correct.

Q. Where did you study? A. At the University of Cincinnati.

Q. Chemical engineering and chemistry? A. General chemistry.

Q. Ever since that time you have been with the Hilton Davis Company? A. As soon as I left school I joined the Hilton Davis Company.

Q. What connection if any have you had with printing inks? A. The Hilton Davis Chemical Company is a consultant chemist for printing ink manufacturers, and my work for the past 16 years has been in a consulting capacity for printing ink manufacturers, printers and allied industries.

Q. In the course of that work you had occasion to examine and compound printing inks, have you not? A. I have.

Q. You are familiar with the ingredients that go into (359) them? A. I am.

The Court: How long have you been out of school?

The Witness: 16 years. In 1926 I joined the Hilton Davis Chemical Company.

Q. During how much of that time have you been working on printing inks? A. I never left the work of printing inks; that is, we are called in by different printing ink manufacturers on consulting work, and I have always some

type of problem ahead of me on printing ink, compounding printing ink, varnish or some allied type of product.

Q. You have read the patent in suit, have you not? A. I have.

Q. Will you please take it and discuss it, explaining it to the Court, as one skilled in the art. A. The patent No. 2,087,190 of Mr. Gessler states in the first paragraph as follows:

> "The present invention relates to printing inks and has for an object the preparation of a novel type of printing ink, which possesses many advantages over the printing inks heretofore known and overcomes many of the disadvantages associated with the procedure which it has been necessary to use in order that such inks may be properly applied to produce a satisfactory print."

(360) Mr. Byerly: I object to this witness reading the patent or interpreting it. It seems to me that if there are any technical terms that are in any way obscure he has the right to explain those to your Honor, but clearly the interpretation of the patent is a matter for the Court, and it seems to me if parts of it should be read counsel should read them to your Honor, but I object to the witness reading this patent or expressing his own interpretation of it.

Mr. Free: He is not going to interpret anything. He is merely reading the patent and explaining such parts as need explanation.

The Court: Suppose you read to him such parts, and ask him what that means. He cannot take over the job of the Court, much as I would like to have him.

Mr. Free: I am not asking him to. I want him merely to explain some of the things that are in the patent.

The Court: You point out what you want him to explain.

Q. Now in line 41 in the first column, it is stated:

"It has also been proposed to use various types of lacquer in printing processes, particularly cellulose lacquers. As is well known, the cellulose solvents used in these lacquers are characterized by a high degree of volatility."

(361) Q. Are you familiar with such lacquers? A. I am.

Q. What are they usually composed of? A. Of nitrocellulose and volatile solvents, a pigment and a plasticizer.

Q. The volatile solvent is the solvent for the resin, is it not? A. For the resin.

Q. Like nitrocellulose? A. Like nitrocellulose.

Q. You mix them up and make your varnish that way? A. That is correct.

Q. Then you put in the plasticizer—tell us again what the plasticizer is supposed to do? A. When we dissolve nitrocellulose in a volatile substance such as ether and alcohol, and allow it to evaporate, then we will have a thin glass-like film, which, if spread on a piece of paper, and if the paper were to be creased, would just snap off like so much glass. If we add to that a small amount of castor oil, or dibutylphthalate, this plasticizer will remain in the nitrocellulose after the solvent has evaporated, and then this evaporated film may be bent and becomes rubber-like, and that is the sole purpose of a plasticizer.

Q. The plasticizer, in other words, is not the solvent? That stays in the film even after the solvent is evaporated? A. The plasticizer is the material that remains with the resin or the nitrocellulose and (362) gives it its rubbery-like characteristics. It can be illustrated even better with rosin. We all know if we dissolve rosin in a volatile solvent and spread it on a piece of glass, after the solvent has gone the rosin is very dry and brittle, and if we add to that a

small amount of, let us say linseed oil, and then brush on this type of lacquer containing volatile solvent, rosin and linseed oil, after the solvent is dry we then have a true film that can be scraped off with a ribbonlike characteristic and can be stretched and bent; whereas with a resin it would be impossible to do this, and it is common practice in all lacquers where you have a solvent and a resin to add a plasticizer to give this rubberlike effect to the resin.

Q. How long has that been in practice? A. That was in practice with the Duco lacquers, of course, in the 1920s. It was common practice—oh, I will have to stop there. It is a common practice to add an oil with a resin to give a true film.

Q. The pigment, that is mixed in the varnish, what happens to that when the solvent evaporates in these lacquer-type inks you are talking about, either inks or paints? They are both the same. A. Either inks or paints or lacquers are compounds in practically and basically the same way. If we stir, for example, this resin with (363) alcohol —say we take plain alcohol and resin and stir in a little pigment, such as carbon black, which is soot, we will have a black varnish. If we allow that to dry we will only have a black pigment and the resin remaining. If we had a little plasticizer in there we have the complete paint or lacquer or ink. The volatile solvent is evaporated. We have left as a film a pigment bound onto the surface by a plastic resinous film. The plastic and the resin merely bind the pigment to the surface.

Q. How would you compare these volatile inks with the volatile lacquers you have been talking about?

Mr. Byerly: I object to that. It seems to me the question should be a little more specific. No volatile inks have been mentioned.

The Court: We want to go into the whole theory that is vital to this case.

Q. An ink in general is a surface covering, is it not? A. It is.

Q. And as in all these volatile inks, ink is applied to the paper and the solvent is evaporated.

Mr. Byerly: I object to that. There has been no mention in the patent of volatile inks as far as I know, and the witness has been talking about lacquers. What all these volatile inks mean I don't know.

Mr. Free: I am still talking about that section (364) of the patent which I read to him, which says,

"As is well known, the cellulose solvents used in these lacquers is characterized by a high degree of volatility."

Q. Will you look at the second column, about the third line of page 1, where he says:

"I have discovered, however, that if in contrast to the above, cellulose compounds, particularly nitrocellulose, are dissolved in solvents with high boiling points, this difficulty may be avoided."

That is the difficulty of rapid evaporation, and I now refer you to the catalog of Carbide and Chemical Company, which is in the answer book, pages 12 and 13. I will read the statement on page 13 describing butyl carbitol.

"Butyl Carbitol is the monobutyl ether of Diethylene Glycol. This compound possesses a mild odor, is soluble in water and is an excellent solvent for nitrocellulose and resins. As indicated by its boiling point, butyl carbitol is intermediate between the 'high boiling' nitrocellulose solvents and the plasticizers. In consequence it is especially useful in pyroxylin dopes and other plastics where a solvent with an extremely low rate of evaporation is required."

(365) Now I want to ask you whether the solution there described, namely, of butyl carbitol and nitrocellulose, will give you a varnish which has a low rate of evaporation, as

described in the patent? A. That is exactly the same type of varnish described in the patent.

Q. In making up the varnish as is described in this catalog, 1929 catalog, what would you do to make the varnish as thick as you like?

Mr. Byerly: I object to that, your Honor. The catalog, if I read it correctly, does not describe making up any varnish.

Mr. Free: He just said the solution of butyl carbitol and nitrocellulose makes a varnish.

Mr. Byerly: The witness said that, but the catalog does not. Does your Honor have the catalog there? It simply describes the solvent, and says what it can be used for, but it does not describe the varnish.

The Court: That is right.

Mr. Free: All right, then I will strike the question.

Q. In making up the solution of butyl carbitol and nitrocellulose as described in this publication, how would you go about making a varnish that was thick?

Mr. Byerly: Your Honor, that seems to me the (366) same question. He puts in "as described".

The Court: It is the same question in another way.

Mr. Free: All right.

Q. Suppose you mixed butyl carbitol and nitrocellulose as described in this catalog, what would you get?

Mr. Byerly: He still has "described in this catalog".

A. You would get pyroxylin dope.

The Court: He did not say that, did he?

Mr. Free: It states here that this compound is "an excellent solvent for nitrocellulose and resins", and I am asking him what he would get if he made a

solution of those two, nitrocellulose and butyl carbitol, and he said a varnish.

The Court: All right, let it go. I think we will adjourn at this point until 2 o'clock.

(Recess to 2 p.m.)

(367) AFTERNOON SESSION

CLINTON TAYLOR resumed the stand.

Direct examination resumed by Mr. Free:

Q. Still referring to the patent in suit, Mr. Taylor, at the end of the second column of the first page, line 54, the patentee, after describing his solvents, that is describing a group of solvents, says:

> "Among this peculiar class of solvents I have found as an example diethylene glycol monobutyl ether to be a solvent for nitrocellulose and many natural and artificial gums, very well adapted to the purposes of this invention."

I ask you again to refer to the catalog which we were talking about, the 1929 catalog of Carbon and Carbide Chemical, page 13——

> The Court: Where are these pages numbered?
> Mr. Free: At the bottom, your Honor (indicating).
> The Court: Oh yes.

Q. —and ask you whether you find on page 13 a statement anything like that I have just read?

> Mr. Byerly: I object to that, your Honor. The question whether statements are similar or dissimilar is clearly for your Honor.

The Court: I do not see any probative value to that at all.

(368) Mr. Free: I merely ask him whether he finds that statement.

Mr. Byerly: I object to that, your Honor.

The Court: He may answer yes or no.

A. Yes.

Q. Now in the latter part of the statement in the catalog is this sentence:

> "In consequence it"—butyl carbitol—"is especially useful in pyroxylin dopes and other plastics where a solvent with an extremely low rate of evaporation is required."

Then I would like to ask you what you understand to be the meaning of pyroxylin dopes? A. Pyroxylin dope is a solution of nitrocellulose in a solvent with a plasticizer. The name was commonly given to dopes used during the first world war for coating airplane wings. It is a type of pyroxylin varnish with plasticizer solvent and nitrocellulose.

Q. What is pyroxylin? A. Pyroxylin is nitrocellulose—first I should explain what nitrocellulose is. We take ordinary cotton and treat it with nitric acid and sulphuric acid for a certain period of time. A reaction takes place which gives this cotton a new property. It becomes soluble. This treated cotton becomes soluble in such solvents as ether and alcohol, amyl acetate, and of (369) course butyl carbitol and similar solvents that we have been mentioning. Nitrocellulose, as a complete group, is divided into two parts. The completely reacted cotton is called "gun cotton." Now to differentiate between gun cotton and the industrial nitrocellulose, used in lacquers, we call the latter pyroxylin. We call this pyroxylin, and that immediately means those nitrocelluloses which may be used in lacquers, collodion and all of the common industrial type of nitrocelluloses, as differentiated from gun cotton.

Q. State whether or not this pyroxylin dope is a sort of varnish?

Mr. Byerly: I object to that, your Honor. That is purely a question of opinion. He says it is used for covering airplane wings, or protecting them. That gives your Honor the information, but I think this juggling of words in trying to express opinions as to whether things are similar is—

The Court: What is the question?

(Question read.)

The Court: Objection sustained.

Mr. Free: Just to save time I would like to note on the record, your Honor, that in this same catalog, 1929, Carbon & Carbide Chemicals, there is a table of physical properties, and in the first line—

(370) The Court: At what page is that?

Mr. Free: Right here (indicating)—and in the first line butyl carbitol is listed; in about the fourth column the boiling point is given at about 220 degrees Centigrade, and in the second from the last column its vapor pressure at 20 degrees Centigrade is given as .05 millimeters of mercury.

Q. Now, Mr. Taylor, will you take up the Lefferts and Stevens patent——

Mr. Free: Which is the first one in the book, your Honor, in chronological order.

Mr. Byerly: If your Honor pleases, it seems to me that the witness should not present an argument as to this patent. If they are not comprehensible to your Honor he may define the terms, but he is given a patent and asked to take it up. I presume that means to present an argument about it. Now this patent is before your Honor and speaks for itself, and if there is anything obscure in the way

of technical terms I am sure the witness can explain it, but I think it is incompetent for him to present an argument which has a bearing on the case, or anything like that.

Mr. Free: I haven't asked him a question.

Mr. Byerly: He said "Will you take up".

The Court: You have no knowledge of what he is (371) going to ask. It depends on the question.

Mr. Byerly: All right, then I withdraw the objection.

The Court: Is this going to the question of anticipation?

Mr. Free: I beg your pardon, sir?

The Court: Are these patents offered on the question of anticipation?

Mr. Free: Yes. Those are all in the answer.

Q. On the first page of that patent, line 10, it is stated that "Our invention relates to an improved ink for use in the process of printing upon celluloid and other solid pyroxylin compounds". Give us some examples of what common pyroxylin compounds you know of.

Mr. Byerly: Your Honor, I object to that unless it is limited to the date of this patent. The patent is dated in 1888. What common pyroxylin compounds were at that time may be relevant, but certainly what happened later is not.

The Court: Do you know anything about it at that time, in 1888?

The Witness: Yes sir.

The Court: You may answer.

A. The common pyroxylin compounds of this date—— (372) Q. 1888? A. 1888—were the well known celluloid compounds made of low viscosity or pyroxylin type nitrocellulose, a plasticizer such as camphor and used, as we know, for combs, cards, calendars, all types of advertising mediums, and of course needed to be printed upon.

Q. How do some of those old pyroxylin compounds you have reference to compare, to modern articles of trade for example? A. Pyroxylin has not changed. They may have found new uses for them, but they are still nitrocellulose and plasticizer.

Q. Can you name some of the commercial articles which are similar? A. Well, a most common one is lacquered cellophane, which has a coating of pyroxylin lacquer over it to make it waterproof.

Q. And that is printed on, too, nowadays, isn't it? A. It is a common practice to print on moisture proof cellophane.

Q. The patent in suit, at line 38, second column of page 2, refers to "lacquered surfaces of Cellophane", and I would like to have you state whether or not that is comparable to the surfaces referred to by Lefferts and Stevens.

Mr. Byerly: I object to that, your Honor. He may tell what both surfaces are, but I object to his answering a vague opinion question as to "comparable".

(373) The Court: Objection sustained.

Q. Well are they the same surfaces, or are they not? A. The lacquered moisture-proof cellophane has the same type of surface which Lefferts and Stevens speak of.

Q. Now in printing on the lacquered surface of cellophane, or some other surface like pyroxylin, as Lefferts referred to, you have a condition of lack of porosity, do you not, to contend with? A. That is correct.

Q. And that is stated to be the case by Lefferts in line 13 of the first column, is it not?

Mr. Byerly: Which page?

Mr. Free: The first page.

Q. It states there "As this material is of a hard solid and non-porous nature, ordinary printing-ink is unfit for this purpose". Is that right? A. Yes.

Q. Now that presents, from your experience as one skilled in printing ink—would you say that it is difficult to print on lacquered surfaces like cellophane? A. It is very difficult.

Q. More difficult than on paper? A. Very much more.

Q. Is it fair to say that an ink which will print on cellophane will also print on paper? A. It will.

Q. It is an easier job to print on paper? A. Very much.

Q. Now at the top of the second column of the Lefferts patent, page 1, it is stated, in about line 52:

> (374) "The ingredients entering into the compound"—that is the ink he is talking about—"are: First, a solvent or a mixture which is a solvent of pyroxyline; second, a pigment or coloring material in powdered form; third, a gum, gums, or binding agent for holding the particles of pigment together."

I ask you whether that describes a conventional printing ink or not; that is, the ingredients? A. It does, the ingredients.

Q. Down on line 15 of page 2 he describes the kind of solvents he is talking about:

> "The office or function of the solvent is to penetrate the material and serve as a vehicle for carrying the color and fastening it on or to the surface thereof."

I ask you whether that describes the usual function of solvent vehicles used in inks? A. In a certain sense, yes.

Q. Then he goes on to say, in line 18:

> "With regard to the liquid menstrua which might be used, it is desirable that they be of a low volatility."

The Court: What does "menstrua" mean?

Mr. Free: The solvent, the vehicle in which the resin is dissolved.

(375) Q. (Continuing) Now what do you understand to be the meaning of the term "low volatility" as applied to solvents for printing inks, particular nitrocellulose types?

Mr. Byerly: I object to that, your Honor, unless it relates to the year 1888. Of course a good deal more is known about those now than at that time, if he is explaining the patent.

The Court: The witness must confine himself to the state of the art at the time of the patent, 1888.

Mr. Free: We are reading from the patent of 1888, and I merely asked him what he understood the expression to mean "low volatility" as applied to the patent.

The Court: How does he know what the term meant in 1888.

Mr. Free: I take it it means the same thing. It is a publication——

The Court: You haven't asked him that. Ask him.

Q. Does that term, "low volatility", mean to you what is commonly understood to be the meaning of that term today?

Mr. Byerly: I object to that, your Honor. The question is what the patentee meant in 1888, and what the term "low volatility" indicates to this witness today seems to me is entirely irrelevant.

(376) The Court: What did that term mean to a chemist back in 1888; do you know?

The Witness: Yes sir. It——

The Court: How do you know?

The Witness: Well, your Honor, if you are going to work at room temperature with these oils——

The Court: No, I mean how do you know what that meant back in 1888, what this patentee meant when he used that term 50 years ago or 60 years ago.

The Witness: That is explained on his first page, which we did not read, line 35—I think it is in there.

Mr. Free: No. It is down at the bottom of page 2, the first column, line 62:

"As above stated, it is desirable"——

The Witness: Yes, that explains it.

Mr. Free: "As above stated, it is desirable that the substances used for this office"—that is the solvent—"be of a slow-drying nature by virtue of which property they will keep the ink in a moist condition for a long time, producing an action somewhat similar to that of linseed-oil used in the preparation of common engraving or printing ink."

Now on page 2, line 33, he lists a series of (377) solvents, and I asked you whether those solvents fulfilled those qualifications; that is, low volatility and slow drying so as to stay moist a long time. A. These oils have all the properties that are given, low volatility and workability at room temperature; that is, the solvents for pyroxylin, yes—and they have all bodies which when pyroxylin is dissolved in them make it possible to make a printing ink out of them.

Q. If you were to make a printing ink out of them, as instructed in this patent, how would you go about mixing the solvents and the nitrocellulose to get the proper viscosity? A. Well that is quite simple. You take a portion of the solvent, and, we will say for example, a pint of the solvent, and dissolve in it a few ounces of pyroxylin, and if the body is too thin just simply add a little more pyroxylin, stir it into solution and when you get a body equal to linseed oil then you proceed and use that in making an ink.

Q. In order to get the ink thicker you use more pyroxylin? A. You use more pyroxylin.

Q. In order to get a thinner one you use less? A. That is correct.

Q. Or more solvent? A. Yes.

Q. Now what does he say about plasticizers in order (378) to get the proper condition of the film after drying? Do you find any reference to a plasticizer in the patent? A. Yes. He says castor oil may be added to assist in the operations, with gums as a binder. Castor oil is a common plasticizer.

Q. That is referred to in line 11 of the first column of page 2? A. Yes.

Q. Now as to the properties of this ink, he says on page 2, line 70:

> "Our improved ink, produced as above described, possesses many advantages over those heretofore compounded for use on pyroxyline material, its chief and most important characteristic being that that portion which remains on the surface of the material is capable of being so hardened or baked as to resist a great amount of rubbing without being defaced. In using this ink for printing from engraved plates we prefer to employ heat and pressure, which are applied to the plate and material, the effect being that the ink partially penetrates the surface of the material, while that portion remaining on the surface is baked or hardened, so as to form a hard durable surface. This property of the ink distinguishes it from all other mixtures or inks of which we know."

(379) I would like to ask you whether you have tried out an ink like that, as described in this patent, and found that to be so or not? A. I made such an ink and found that it did dry when heated, printed very well and had all those properties.

Q. Now I wonder if you could show us an ink made up in accordance with this patent, and demonstrate how it works with heat? A. I have such an ink here.

Mr. Free: Your Honor, it will take a minute or two to have the heater set up.

Q. You have produced a small container of ink made up in accordance with the Lefferts and Stevens patent? A. I have an ink here in accordance with the Lefferts and Stevens patent.

Q. Will you please describe what the ingredients are and how you mixed them up? A. The ingredients are oil of cassia——

Mr. Free: Just for the record, "oil of cassia" is referred to in line 34 of page 2 of the Lefferts and Stevens patent, and elsewhere.

A. (Continuing) One-half second nitrocellulose, which is a low viscosity nitrocellulose——

Q. Is that the same as pyroxylin referred to in the patent? A. That is the same as pyroxylin—and castor oil as a plasticizer.

(380) Q. That is refetred to in line 11 on page 2 of the patent? A. And chrome yellow as a pigment.

Q. How did you happen to select yellow as a color? A. I selected that because that is the same pigment that Gessler used in his ink, and I have also, as a comparative ink, an ink made exactly on the Gessler formula, chrome yellow 100 parts; one-half second nitrocellulose 35 parts; butyl carbitol 55 parts; dibutylphthalate 10 parts, and blown castor oil 10 parts.

Mr. Free: Again, for the record, that formula is shown on page 2, the first column, between lines 20 and 27 of the Gessler patent.

Q. Now will you take a sample of each of the inks, that is Lefferts and Stevens and Gessler as you have made them up, and put them on a piece of paper side by side. A. I have marked this pad of paper which I am going to use for demonstration on the left side, "L.S." for Lefferts and Stevens ink.

Mr. Free: I will mark that piece of paper for the time being as Defendant's Exhibit H for identification.

(Marked Defendant's Exhibit H for identification.)

Mr. Free: I will offer it later.

(The witness demonstrates.)

Q. Now describe what you are doing there. A. I have (381) placed a small amount of Lefferts and Stevens ink under the letters "L.S.", and on the same pad to the right, under the name "Gessler" I put an equal portion of the Gessler ink.

Q. Now as it is spread rather thickly on that paper, Defendant's Exhibit H for identification, is it showing any sign of evaporation? A. No. That will not evaporate at room temperatures, as I will show.

I will now take what is commonly known as a pull down knife and make a thin pull-down of these two inks, one against the other (demonstrating).

Q. You have now spread those two inks in a thin film on the exhibit, the paper, Exhibit H for identification, have you not? A. I have.

Q. Side by side? A. Yes. Now, your Honor, you can see they are still wet (handing to Court).

The Court: Both of them?

The Witness: Yes.

Mr. Free: The witness smears the two rows of ink on Exhibit H for identification, to show they are still wet.

The Witness: Now in the heat process to test inks in the laboratory, we simply pass them over this way (illustrating).

Q. I noticed as you passed the paper over the burner (382) smoke or fume seemed to rise. What is that? A. That is the volatile solvent leaving the ink.

Q. Being driven off? A. Being driven off by the heat.

The Court: In one of them, or both?

The Witness: Both of them.

Q. How do you find those inks after you pass them over the heat on Exhibit H for identification? A. Gessler ink is dry; Lefferts and Stevens ink is dry. I test these by running my fingers over the ink (illustrating).

The Court: They are both dry after passing over the heat?

The Witness: Yes. Now this part, the upper portion that I did not pass over the flame, should still show that the inks are not dry, where the ink was not passed over the flame.

Q. And you have demonstrated that by smearing the top ends of the columns on Defendant's Exhibit H for identification? A. That is right.

Mr. Free: I offer in evidence as Defendant's Exhibit H the exhibit sheet just provided by the witness and formerly marked for identification.

(Defendant's Exhibit H for identification received in evidence.)

(383) Q. After that demonstration with Exhibit H, tell me whether or not what you have just demonstrated and shown us conforms to this description in the Lefferts and Stevens patent:

"By means of our improved ink, when used in connection with heat and pressure, as above stated, a hard and permanent impression is produced, and the printed sheets or articles may be piled together immediately after they are taken from the press."

That is in line 109 of the second column of page 2. A. That is exactly what I demonstrated, that after these two inks were passed over the heater the inks were completely dried, and had they been coming from a printing press they could have been piled one on top of the other without offset.

Q. The drying time when the paper was passed over the heat was a matter of a second or two, was it not? A. A matter of a few seconds.

Q. I notice at the top part of the ink on Exhibit H is still moist. That part did not pass over the heat?

The Court: No, I do not think it is moist.

Q. They are both still a little moist? A. Yes, that portion did not pass over the heater.

Q. And is it fair to say that the Lefferts and (384) Stevens ink which is still moist after quite a while is, as stated in line 64, of such slow-drying nature by virtue of which property they will keep the ink in a moist condition for a long time?

Mr. Byerly: I object to that. Whether that is a fair statement I think is for the Court to determine. I think it is for the Court to determine whether it has been a long time or not, and not for this witness.

The Court: He can state if he has tried it what the results of his experiments were.

Mr. Byerly: I think the question was predicated on the experiment here and the state of the exhibit now.

Q. How many times have you tried these Lefferts and Stevens inks? A. Oh, dozens of times.

Q. Did you or not find it to be a fact that they kept moist for a long time even when exposed to air? A. They will keep moist for a period of weeks.

The Court: That sheet, Exhibit H, would be moist for weeks if you had not put it over the flame?

The Witness: Except for what portion might be absorbed by the paper. If that were glass it would remain sticky or tacky for weeks.

Q. How about ink rolls, would it have the same property on ink rolls? A. The same property on ink rolls. It would have a long press life.

(385) Q. Is that due to the low volatility of the solvent or not? A. That is due to the low volatility of the solvent. Of course, it is only common sense if the solvent does not evaporate at room temperature the ink will stay moist.

The Court: What solvent did Stevens use?

The Witness: The solvents then known in 1888, the natural solvents from the plants, such as oil of cloves, oil of cassia, cinnamons.

The Court: Was butyl carbitol known at that time?

The Witness: Not until 1928.

Q. Have you made up any other inks in accordance with Lefferts and Stevens' formulas and printed with them? A. I made up inks of all his formulas in small quantities, and I printed with nitro-benzole primarily, because nitro-benzole is mentioned here. Nitro-benzole is a common industrial chemical that is easy to obtain, and I made prints of that ink against the butyl carbitol, and I have those ink prints with me.

Q. Can you show them to us, please? A. (Producing.)

Mr. Free: The witness shows me a cardboard having on it four samples of printing, and I ask that this cardboard be marked for identification as a whole.

(Marked Defendant's Exhibit I for identification.)

(386) Q. Will you tell us what that Exhibit I for identification shows? A. Exhibit I for identification is a comparative chart of the ink, as taught by Lefferts and Stevens, printed in comparison to the ink as taught by Gessler. The formulas are given for the Lefferts and Stevens formula, as follows: 120 parts of chrome yellow pigment, 50 parts of H rosin, 9 parts of castor oil, 30 parts of nitro-benzole.

Mr. Byerly: Would you ask the witness to read that formula again?

Q. Yes. A. Chrome yellow pigment 120 parts, H rosin 50 parts, castor oil 9 parts, nitro-benzole 30 parts.

Q. You referred to the upper lefthand corner illustration, did you not? A. The formulas for two proof prints on the upper part of the charts are for a Lefferts and Stevens type of ink.

Q. Let us mark the one on the upper righthand corner with the number 1 and the one on the upper lefthand corner with the number 2. Now, will you tell us the difference between those two? A. The inks are exactly the same. No. 1 is printed on paper. No. 2 is printed on cellophane, moisture-proof cellophane. This yellow color that I just pulled down here shows that they were heat-dried. For a test I put this ink on a small printing (387) press and printed these samples.

The Court: Which ink?

The Witness: I used the Lefferts and Stevens ink. One is on paper and one is on moisture-proof cellophane. I then passed them through an oven and dried the ink. I left them in the oven about ten seconds at 150 Degrees Centigrade.

Q. When they came out how dry were they? A. Completely dry.

Q. From your experience with these inks would you indicate what degree of quality they exhibit?

Mr. Byerly: I do not quite understand it. You mean what quality of printing you have here?

Mr. Free: That is right.

Mr. Byerly: I do not think this witness has been qualified as an expert printer.

The Court: The objection is sustained.

Q. In your experience with testing inks in this fashion, what can you say about the quality of the print?

Mr. Byerly: That is the same question.

The Court: The same question.

Q. How many times have you done printing with inks of all kinds in this fashion? A. Since 1926 that has been one of the major parts of my work.

Q. Tell us how you go about it? A. We have what is (388) known as a small proof press and the ink is spread out on a plate with a roller. Then the type on the proof press is inked and a proof pulled. The proof was dried, as I mentioned, in an oven, and the same test was made with the Gessler type ink.

Mr. Free: I think he is qualified to answer that question now, your Honor. He has done that so many times, and now I would like to ask him.

Q. From those tests over the period of 16 years, I believe you said, what can you say as to the quality of the printing compared with other similar printing tests that you have made?

The Court: I do not see any printing on here.

Mr. Byerly: If there is going to be some information given as to quality, as to whether you can use it in a magazine, or whatnot, that would require a printer and not just a chemist who makes up proofs.

The Court: What is the question?

Clinton Taylor, for Defendant—Direct.

Mr. Free: I am asking him what the quality of those prints are, whether good printing or not, based on his experience with similar testing work done over many years.

The Court: I do not think he is qualified to say that.

Q. Now, will you discuss the two lower sheets on this (389) card, which I mark 3 and 4, Exhibit I for identification, and tell us what they are. A. In order to make a comparison between the Lefferts and Stevens ink I had to make up an ink as taught by Gessler, and these two lower prints are prints of such an ink as the one taught by Gessler.

Q. What are the formulas? A. The formula is: Chrome yellow pigment 120 parts, H rosin 50 parts, castor oil 9 parts, butyl carbitol 30 parts.

Q. No. 3 is printed on paper as is No. 1, and No. 4 is printed on cellophane as is No. 2, is that right? A. That is correct.

Mr. Free: I offer in evidence as Defendant's Exhibit I the card identified by the witness.

Mr. Byerly: I object to that as not proving anything, because in the first place the formula given for the ink at the top is not a formula found in the Lefferts patent, and, in the second place, these are mere samples of test printing, and give no perception of how the inks would work in an actual printing press.

Mr. Free: As to the first objection, nitro-benzole is listed in line 35 as one of the solvents in Lefferts and Stevens.

The Court: I think the first objection should be overruled. I think the second one is good. That is not (390) a real commercial printing job.

Mr. Free: This is merely to show that Lefferts and Stevens' inks make prints when put on paper

and cellophane, and thereafter if heated the volatile solvent dries off.

The Court: We have already had that drying off.

Q. Now, I would like to ask you what you know about vapor pressures of some of the solvents shown and described in the Lefferts and Stevens patent. A. One of the first things that I did in comparing these solvents mentioned in the Lefferts and Stevens patent was to take their vapor pressures in accordance with the Gessler patent, using the Brewer and Gardner method.

Mr. Free: That is referred to in line 64 of page 2, column 1 of the patent, and I offer in evidence a photostatic copy of the Brewer and Gardner article referred to in the patent in suit, as Defendant's Exhibit J.

(Marked Defendant's Exhibit J.)

Q. The Brewer and Gardner article referred to in the patent here in suit states, on the first page, second column:

"The procedure followed in determination of (391) the vapor pressure was that originally described by Ramsay and Young."

Tell me whether or not you used as Brewer and Gardner did the Ramsay and Young method, and how you went about doing so? A. After reading this article, of course, I got out the Ramsay and Young method of taking vapor pressure, and set this equipment up in the laboratory as described by Ramsay and Young, with one exception, that Brewer and Gardner had added a large flask to their equipment.

Mr. Free: The authority for doing so is found in Brewer and Gardner, in the second column. It says:

"It is particularly important that a large, insulated bottle be inserted in the system in order

to obtain more constant pressure readings." Otherwise the apparatus is precisely as described in the Ramsay and Young article, and to illustrate what Ramsay and Young's method is I offer in evidence photostatic copy of the original of Journal of the Chemical Society, for 1888, pages 42, 43, 44 and 45, which is referred to in the footnote 6 of the Brewer and Gardner article.

(Marked Defendant's Exhibit K.)

Q. You erected apparatus in accordance with Ramsay and Young and Brewer and Gardner? A. I did.

(392) The Court: This article was printed after this patent was applied for?

Mr. Free: Yes, it is referred to in the patent in suit.

The Court: What is the probative value of it?

Mr. Free: Merely to show that we are using the same method that the patentee used to determine the vapor pressure, as used in the Lefferts and Stevens patent.

Q. I hand you three photographs of apparatus and ask you whether that represents what you used to determine vapor pressures of certain solvents? A. These are photographs of the equipment that I set up in the Hilton Davis laboratory to determine the vapor pressures of all the solvents in the prior art, and, second, of the solvent butyl carbitol specified by the Gessler patent.

The Court: When did you make these experiments?

The Witness: These experiments started in September 1941.

The Court: After this suit started?

The Witness: Yes.

Q. And some of those vapor pressure tests with that apparatus shown in the photographs were conducted in the presence of plaintiff's counsel, Messrs. Byerly and Watson? A. Yes.

(393) Mr. Byerly: That was only for a small part of the tests. They showed us the apparatus, your Honor, I will be glad to admit that.

Mr. Free: I offer in evidence the photographs of the apparatus used by the witness to determine the vapor pressure characteristics of certain solvents, as a group, as Defendant's Exhibits L-1, L-2 and L-3.

(Marked Defendant's Exhibits L-1, L-2 and L-3.)

Q. With this apparatus shown in these photographs, L-1, L-2 and L-3, according to the Brewer and Gardner method mentioned in the patent in suit, you measured the vapor pressure of certain solvents of Lefferts and Stevens, did you not? A. I did.

Q. Which ones? A. I measured the vapor pressure of all the solvents of Lefferts and Stevens, except the oil of hyssop, which I could not obtain. It was necessary to do this, inasmuch as Gessler has specified a certain vapor pressure, and I did use the method that Gessler has so carefully written out here, the Brewer and Gardner method.

Mr. Byerly: I object to the qualification the way things are written out. The patent mentions that they may be measured by this method, and I think the witness's answer should go out as argumentative.

The Court: Strike it out, that last part of it.

(394) Q. You did use the Brewer and Gardner method described in the patent in suit? A. Exactly.

Q. Let us take up first the solvent whose vapor pressure you measured with this apparatus, L-1, L-2 and L-3, in the presence of Mr. Byerly and Mr. Watson, what was that? A. That was oil of clove.

The Court: Oil of clove is used as a solvent, is it?
The Witness: Yes.

Q. With the apparatus you tested oil of clove and noted down the vapor pressure readings? A. I did.

Q. Do you recall that those readings were checked by one of plaintiff's representatives? A. They were.

Q. Do you have the reading sheet that you noted the data on during those tests in the presence of plaintiff's counsel? A. This is the sheet that I put my readings down on as I took them before the plaintiff's counsel.

Mr. Free: I offer in evidence as Defendant's Exhibit M the data sheet provided by the witness, showing the vapor pressure, the millimeters of mercury at certain temperatures Centigrade, of oil of cloves mentioned in the Lefferts and Stevens patent.

Mr. Byerly: I object to the exhibit on the ground that there is no proof as to the fact that this (395) was oil of cloves of the type of oil of cloves that was current in 1888.

Q. Where did you get the oil of cloves? A. From Fritchie Bros.

By the Court:

Q. Has there been any improvement in oil of cloves since 1888? A. No improvement. It was U.S.P. oil of cloves, commonly sold in drugstores.

Q. Do you know whether it was the same in 1888? A. It comes from the clove plant.

Q. You do not answer the question. Do you know whether oil of cloves in 1888 was the same as this that you used? A. Well, I would say it is.

Q. How do you know it is? A. The plant certainly has not changed any.

Q. It is an extract made by a process? A. An extract of oil from the plant.

The Court: The objection is sustained. The witness cannot identify it as the same oil of cloves.

By Mr. Free:

Q. These tests were made from an oil of cloves made recently by you? A. They were.

Q. How is oil of cloves made, do you know? A. It is made by extracting the small clove seeds and also it is taken from the blossom of the clove plant.

Q. How is the oil of cloves furnished to the trade, (396) how do you buy it? A. I bought it in a one-pound bottle.

Q. The same as you buy any other oil or solvent? A. Exactly.

Q. You go to the manufacturer and buy it? A. That is right.

Q. The same as you buy butyl carbitol? A. Certainly.

Q. Or ethyl alcohol? A. Yes.

Mr. Free: I offer now this report of Mr. Taylor's on the vapor pressure of oil of cloves as oil of cloves is now available, as indicating the vapor pressure of it, subject to the right to prove a U. S. Pharmacopoeia of an earlier date giving the method of extracting the oil of cloves.

Mr. Byerly: I object to that until he has proved it. I have no objection to his marking it for identification for the moment. It seems to me he has not proved that is what the patent refers to.

Mr. Free: These patents published in the Patent Office, often as far back as a hundred years ago, are still available for publication and reference for what they show as to the art, now and from now on.

The Court: Testing out or making chemical tests with a substance that existed in 1888 and comparing it with the substance of the same name of today, does not do any good unless you know you have the substance (397) as it existed in 1888, and there is no proof of that here.

Mr. Free: I think it might be impossible to prove it.

The Court: That may be. It is a problem I do not have to meet.

Mr. Free: The difficulty is with all these things that as time goes on it may be utterly impossible to obtain and produce it here in court.

The Court: That does not do away with the rules of evidence.

Mr. Free: It may be utterly impossible to obtain, 30 years later, oil of cloves which was produced in 1888.

The Court: It can go in as an experiment with oil of cloves as bought on the market today.

Mr. Free: That is all I ask at this time.

The Court: It will be admitted with that limitation.

Mr. Free: And I would like to be free to prove oil of cloves as it existed in 1888, if that is possible.

(Marked Defendant's Exhibit M.)

The Court: In the art of chemistry isn't there some way of tracing these things back and showing what was in them?

The Witness: I think there would be changes in some commercial products, but oil of cloves, oil of cinnamon, are (398) extracted from natural plants, as are oil of wintergreen or peppermint.

The Court: There is no art that has developed like the art of chemistry in the last several years, and we ought to be careful about this.

Mr. Free: I think the burden is really on the plaintiff to show that this oil of cloves is different than it was in 1888.

The Court: You are offering something as it was in 1888, and so it is up to you to prove it.

Mr. Free: I offered the patent, which happens to be published in 1888, to instruct the art from now on and in the future in the making of inks as described in that patent. Now, when he is compounding an ink in accordance with Lefferts and Stevens' patent he would go out and obtain from the source where it was available such solvents as he could, just like one operating under the patent in suit would go out and obtain butyl carbitol at the present time. He would not be asked to go back to 1932 and buy butyl carbitol as it was then, because it would be impossible. And so the same burden attaches to the plaintiff as attaches to us, he had to show the same thing.

The Court: He did not make the objection at the proper time.

(399) Mr. Free: I think the objection is a very poor one, if I may say so, because we are dealing now with a publication which we have before us, and which teaches us what we want to know at the present time.

Q. You have drawn some curves of butyl carbitol and oil of cloves on some cross-section paper, indicating the vapor pressure of the substance as shown on Exhibit M, have you not? A. I have.

Q. Will you tell us how you went about making that curve? A. The points determined on this chart marked "Vapor Pressure Chart" were determined in the equipment as just described, the Ramsay and Young type of vapor pressure equipment, and the determinations were made in the presence of counsel for the plaintiff, simply to show, you might say, that our equipment checks with the Brewer and Gardner equipment.

Q. You plotted those points obtained on Exhibit M on that cross-section paper showing the vapor pressure in millimeters of mercury with increase in temperature, did you not? A. I did.

Q. Referring to that curve for oil of cloves, will you indicate what the vapor pressure is at 20 degrees Centigrade?

Mr. Byerly: I object to this on the same ground, that it is not the oil of cloves of 1888. I think (400) if it is admitted at all it should be subject to the same exception that your Honor made before.

The Court: The record shows all that, so go ahead.

Q. (Read.) A. That chart does not have 20 degrees Centigrade on it. This chart was merely made to check the points determined while the plaintiff's counsel was present.

Q. State whether or not the vapor pressure of oil of cloves as shown on this chart is less than .1 millimeters, the lowest point on this curve? A. It is less than .1 millimeters.

Q. Still referring to the vapor pressure curve on this chart, will you indicate what it is at a hundred degrees Centigrade for oil of cloves? A. At 100 degrees it would be 33 millimeters.

(401) Q. And what is butyl carbitol as shown on that curve at 100 degrees Centigrade? A. 60 millimeters.

Q. At 100? A. I did not read that correctly. At 100 degrees butyl carbitol is 6; at 100 degrees oil of cloves is 3.3.

Q. That is in centimeters or millimeters? A. That is in millimeters.

Q. Now will you give the reading for oil of cloves and butyl carbitol at 150 degrees Centigrade, as shown on this chart. A. Oil of cloves at 150 degrees is 32 millimeters; butyl carbitol 68 millimeters.

The Court: Almost on the 70 line, isn't it?

The Witness: Almost on the 70 line it runs.

Q. The data shown on that sheet for butyl carbitol was obtained where? A. On this butyl carbitol there are two

types of data, that taken from Brewer and Gardner, which is a circle, and the points marked with asterisks were determined by me in front of the—with the plaintiff's counsel witnessing the determinations.

Q. Now I show you a set of columns which are marked "Temperatures in degrees Centigrade", and "Vapor Pressure in Millimeters of mercury for butyl carbitol" and ask you whether that represents the data taken in the presence of plaintiff's counsel? A. This is the data taken in the presence of plaintiff's counsel.

(402) Q. For butyl carbitol? A. For butyl carbitol.

Q. Where did you obtain the butyl carbitol? A. From the Carbide & Carbon Chemicals Corporation.

Q. That was obtained in the presence of plaintiff's counsel? A. We opened a sealed drum in the presence of plaintiff's counsel.

Mr. Free: I offer in evidence as Defendant's Exhibit N the data sheet made by the witness in determining the vapor pressure for butyl carbitol.

(Marked Defendant's Exhibit N.)

Q. Incidentally the butyl carbitol that you tested with Exhibit N was obtained from the same source that Brewer and Gardner state they obtained theirs; is that right? A. That is correct.

Q. That is the Carbide & Carbon Chemicals Corporation? A. Yes, sir.

Q. Now will you check the curve you have just referred to with the butyl carbitol readings given in the patent in suit at the bottom of the first column of page 2. A. I have checked these readings at 100 degrees Centigrade and 150 degrees Centigrade. The Gessler patent gives butyl carbitol at 100 degrees Centigrade 6.4 millimeters, and my reading at 100 degrees Centigrade is 6 and a fraction.

At 150 degrees Brewer and Gardner, or the (403) Gessler patent states the vapor pressure of butyl carbitol is about 60 millimeters. I have at 150 about 69 millimeters.

Q. Refer to the Brewer and Gardner article, and tell me what they give as the vapor pressure for butyl carbitol at 150? A. In the Brewer and Gardner article, page 181, they give their readings from which they constructed their chart, and the last reading they took for butyl carbitol— (examining).

The Court: We will take a 10 minute recess in the meantime.

(Short recess.)

Mr. Free: What was the last question?

(Last question read.)

Q. Did you find the reading given by Brewer and Gardner for butyl carbitol at 150 degrees Centigrade? A. The last reading, the closest reading to 150 degrees Centigrade is 152.9, and the reading is 69.3 millimeters vapor pressure.

Q. And you found all the way along in your tests with butyl carbitol that they conform substantially with Brewer and Gardner's reading, did you not? A. I did.

Mr. Free: I mark for identification the chart referred to by the witness, as Defendant's Exhibit O.

(Marked Defendant's Exhibit O for identification.)

(404) Q. Now, Mr. Taylor, I want to ask you whether you made vapor pressure tests with this same Brewer and Gardner apparatus of other solvents named by Lefferts and Stevens? A. I did.

Q. I show you a set of curves which I marked for identification as Defendant's Exhibit O, and ask you whether or not these curves indicate the vapor pressures of the solvents that you have mentioned, that of Lefferts and Stevens (handing to witness)? A. These are curves I made for determining the vapor pressure of the solvents mentioned in Lefferts and Stevens.

Q. These vapor pressures were taken in the same way and with the same apparatus shown in Defendant's Exhibits L-1, 2 and 3, were they? A. They were.

Q. I notice on that set of curves there is butyl carbitol marked heavily. Is that curve based upon some readings you referred to a while ago? A. That is based on the Brewer and Gardner, and upon my readings, that I checked against the Brewer and Gardner readings.

Q. On that same set of curves I notice one marked "S and C 502-C oil" down near the bottom. Tell me whether or not that was measured with the same apparatus shown on Defendant's Exhibits L-1, 2 and 3? A. That was measured with the same vapor pressure equipment.

The Court: What is the "S and C 502"?

(405) Mr. Free: That is the solvent in the ink which is charged to infringe here. That is the defendant's oil.

The Court: What does the "C" stand for, butyl carbitol?

Mr. Free: No, we do not have butyl carbitol or butyl carbitol acetate at all. That is the high boiling petroleum fraction that we have been talking about, made from petroleum.

Q. These oils, including nitro-benzole, oil of pennyroyal, oil of fennelseed, oil of sassafras, shown to the left of the butyl carbitol curve, and oil of cinnamon and oil of cassia and oil of clove shown between the butyl carbitol curve and defendant's 502-C oil were obtained by you in the open market? A. That is correct.

Q. And tested by you to obtain the vapor pressure data shown on this sheet? A. Yes.

Q. And you have plotted it on this sheet? A. I did.

Mr. Free: I offer in evidence the set of curves just identified, as Defendant's Exhibit P.

Mr. Byerly: Your Honor, I object to the exhibit on the ground that the exhibit states it refers to oil

specified in the Lefferts patent, whereas the witness has stated that these measurements were made on the oils of today, not as of 1888.

The Court: We will take them as of today. He (406) said he purchased them in the open market, anyway.

Mr. Byerly: Yes.

By the Court:

Q. May I ask you, are all these ingredients that you tested here used as solvents? A. They are all solvents; yes sir.

Q. Commercially used in the trade of chemistry? A. Oil of cloves is used.

Q. And all of them used for making ink? A. Nitrobenzole and oil of cloves have the properties of the Gessler patent.

Q. How about the cinnamon? A. No.

Q. How about the pennyroyal? A. Cinnamon and pennyroyal and fennelseed, and oil of sassafras possibly; oil of cloves is most common.

By Mr. Free:

Q. That is, oil of cloves today is still being used in ink? A. Oil of cloves today is still being used in ink.

The Court: It will be received.

(Marked Defendant's Exhibit P.)

Q. Still referring to Defendant's Exhibit P, will you indicate from that curve for oil of cloves what its vapor pressure is at 150 degrees? A. The vapor pressure is 33 millimeters at 150 degrees Centigrade.

(407) Q. And what is the vapor pressure of the defendant's oil at 150 degrees Centigrade, as shown on that curve, Defendant's Exhibit P? A. 20 millimeters at 150 degrees Centigrade.

Q. And, again, what is the vapor pressure of butyl carbitol as shown on that curve, Defendant's Exhibit P, at 150 degrees? A. 60 millimeters.

Q. Now oil of cinnamon and oil of cassia also lie between the defendant's 502-C oil and butyl carbitol. Will you tell us what the vapor pressure of those two substances on Defendant's Exhibit P is? A. Oil of cassia at 150 degrees Centigrade is 40 millimeters vapor pressure; oil of cinnamon at 150 degrees Centigrade is 43 millimeters of vapor pressure.

Q. Now I show you a similar set of curves, but straight lines, and ask you what you know about that? How did you go about making that set of curves (handing to witness)? A. This second chart is made on what is known as log paper, and is used to extend the curves shown on chart, Exhibit P, so that we may determine the vapor pressure of the solvents at room temperature.

Q. That is to say, the curves on the sheets you are now referring to are the same as the curves on sheet marked Defendant's Exhibit P, except made in a straight line; is that right? A. That is correct.

(408) Mr. Free: I offer in evidence as Defendant's Exhibit Q the second set of curves, showing solvents obtained from Lefferts and Stevens patent, including butyl carbitol and defendant's 502-C oil.

(Marked Defendant's Exhibit Q.)

Q. In making the test of vapor pressures with the apparatus shown in Exhibits L-1, 2 and 3 with 502-C oil, where did you get that oil? A. From the Sinclair-Carroll Company.

Q. Do you have a sample of it? A. I do (producing).

Q. This sample which you handed me is the same sample from which you took the vapor pressure test in the presence of plaintiff's counsel; is that correct? A. That is correct.

Mr. Free: I offer in evidence as Defendant's Exhibit R the sample container of defendant's solvent in the ink here accused to infringe.

(Marked Defendant's Exhibit R.)

Q. Now, Mr. Taylor, will you refer to the Doughty patent, next in order of chronological sequence, No. 1,439,696. Refer to line 38 of page 1, the first column. I will read:

"A difficulty which has prevented the use of metallic pigment inks is due to vehicles which dry too rapidly on the inking rolls, covering them (409) generally with a gummy coating which prevents transfer of the ink to the type or die."

I want to ask you whether that describes the condition we have been talking about, of inks containing solvents that are too volatile? A. That is exactly what he means.

Q. Then in line 46 he says:

"It is the object of the invention, therefore, to provide an ink and an ink vehicle having the necessary properties, among others comparative slowness in drying without a tendency to become gummy, a consistency permitting transference of the ink through inking rolls to the type or die, rapid drying when applied to the work, and ability to protect the pigment from oxidation and consequent discoloration."

I will ask you whether that describes a property similar to the one you displayed with the heat test of Lefferts and Stevens ink?

Mr. Byerly: I object to that, your Honor. The passage speaks for itself, and the question is incompetent.

The Court: Yes. All that is necessary is to call the Court's attention to that. Objection sustained. It is too obvious to require any explanation.

Q. Then in the second column of the first page, line 1, (410) he states:

> "I have discovered that these desirable properties may be imparted to the ink by the use of a suitable medium in the vehicle for the pigment and that such a medium will, moreover, permit rapid drying of the ink by the application of heat to the type or die."

Now in such an ink as he has described, what results when you apply heat to the type or die printing with the ink?

Mr. Byerly: If your Honor please, the patent states what is the result, and I think that, too, is an incompetent question.

The Court: I think that is correct—unless you want to dispute that statement.

Mr. Free: No. I asked him to characterize it, that is all.

Q. In the next line, 62:

> "The medium"—that is the solvent—"should be volatile, i.e., capable of being vaporized without carbonization, but its boiling point should be relatively high to reduce vaporization at atmospheric temperatures, and consequently to prevent rapid drying on the inking rolls."

Now from your experience with the inks such as he describes, how high should the boiling point be?

(411) Mr. Byerly: I object to that. The witness is not shown to have had any experience with the inks described in this patent, and the patent states what the boiling point is that the inventor had in mind.

The Court: Sustained. These are all questions for argument, I think.

Q. I call your attention to the sentence beginning in line 79 of the second column of page 1:

> "A suitable medium may be found in the derivatives of the terpene series of hydrocarbon compounds, the alcohols, of which terpineol is an example, being admirably adapted for the purpose."

Then down further he mentions benzyl alcohol and terpinyl acetate, benzyl acetate and ethyl benzoate.

I would like to ask you whether you tried out any of the solvents in inks that he mentions there? A. I did. I made up a sample of terpineol ink and tested it for its printing qualities and drying qualities when heated.

> The Court: You mean tried it as a solvent?
>
> The Witness: Tried it as a solvent, and I tried it as a medium in an ink.

Q. Tell us what you discovered when you made those tests with an ink containing terpineol? A. The ink made with terpineol does not dry at atmospheric temperature, (412) but on the application of heat it dries in a matter of seconds.

Q. Can you demonstrate here an ink made up of any of the solvents there described? A. I have such an ink made up with terpineol.

Q. Will you please demonstrate it, as you did before with the Lefferts and Stevens ink. A. I will.

> Mr. Byerly: Your Honor, I wonder if we could ask the witness to state the formula of the ink he is trying.
>
> Mr. Free: Yes.
>
> (At this point the heater was set up.)

Q. You have here a sample of the ink which you made up according to the Doughty patent, have you? A. I have; and I will read the formula:

Chrome yellow pigment, 23 parts; Cumar resin—I would like to put before that that I make a varnish of Cumar resin, 40 parts; terpineol, 50 parts. Of that resin I use 10 parts, making an ink.

Mr. Byerly: Of the varnish you mean you use 10 parts.

The Witness: Of the varnish, Cumar resin and terpineol, I use 10 parts. Now then——

The Court: What did you call that test—what kind of test?

(413) Mr. Free: Vapor test of the ink described in the Doughty patent.

The Court: What exhibit number is that?

Mr. Free: I will mark that for identification as Defendant's Exhibit S.

(Marked Defendant's Exhibit S for identification.)

Mr. Byerly: Did you offer that in evidence?

Mr. Free: No.

Mr. Byerly: Your Honor, I wish to object to this test, on the ground that the formula just stated by the witness widely differs from that given in the patent. If you will look on page 2 of the patent, beginning in the first column, line 38, he states the formula for this stamping ink embodying this invention, in which he speaks of the four parts of terpineol to one part of ordinary resin. You will notice that in the example given a different kind of binder has been used, and the proportions are widely different.

Mr. Free: If your Honor will refer to page 2, line 45, you will see that it states:

"The proportions of resin and solvent may be varied within the limits necessary to produce a vehicle of the proper viscosity."

So you can use any amount of proportions you want to get the thickness.

(414) The Court: Where is that set forth in the patent?

Mr. Free: Terpineol is mentioned.

The Court: How much of it?

Mr. Free: Four parts is mentioned in line 39 of page 2—4 parts of terpineol or benzyl alcohol, if you like.

The Court: He has there one part of ordinary resin.

Mr. Free: Yes, and then the resin specifications differ. You can use any resins you like, such as synthetic resins, which are mentioned on page 1, lines 95 to 102. He says:

"In carrying out the invention the solvent is combined with a thickening agent forming the body of the vehicle. Preferably a resinous material such as colophony (ordinary rosin), dammar, copal, Bergundy pitch or Canada balsam, or a synthetic resin, i.e., a phenol condensation product, is dissolved in the solvent to produce a vehicle of the desired consistency."

The Court: Objection overruled.

Q. Now, Mr. Taylor, will you take a sample of the Doughty ink that you have produced——

Mr. Free: And which I mark in evidence as (415) Defendant's Exhibit T.

(Marked Defendant's Exhibit T.)

Q. —and a sample from the same Gessler ink that you mentioned before——

Mr. Free: And which I offer in evidence as Defendant's Exhibit U.

(Marked Defendant's Exhibit U.)

Q. Place both on a piece of paper side by side. A. I am now making a smear of the Doughty ink on the lefthand side of the pull-down pad, and a similar smear of the Gessler ink on the righthand side of the pull-down (demonstrating).

Q. You are now spreading the ink out thin in two parallel columns? A. Comparable to the thickness that would be applied to a piece of paper when printed. (Witness illustrates.)

Q. You are now smearing the ink to show that it is moist? A. Yes, sir; quite moist.

Q. And you are now passing it over the heater, and what is the smoke that seems to be coming off? A. The solvent is being volatilized by the heater.

The Court: How hot does it get?

Q. They are both dry now, are they? A. They are both dry.

Q. You have passed it over the heater? A. That is (416) correct.

Q. Do you notice any difference in the drying between the two samples? A. I do not.

Mr. Free: I offer in evidence as Defendant's Exhibit T the sample formerly marked for identification, of the ink which was made according to the comparative tests of Doughty and the Gessler inks.

Mr. Byerly: I would like to note an objection to that, because this patent states—the beginning of the patent was not read to your Honor, but you will find in the beginning of the specification, line 12 on page 1:

"This invention relates to inks and vehicles therefor, and particularly to metallic pigment inks suitable for use in stamping titles and decorative designs on book-bindings and for other purposes to which the ink may be adapted."

The patent further specifies a metallic ink. The only examples they specify are an artificial gold or heavy metallic pigment in ink. Now such an ink has not been produced here, and I think there is no objection if your Honor thinks it is of any probative value to show an ink made up of terpineol. I am not objecting to that, but that ink is so far from the patent that I would like to object to it on that basis.

Mr. Free: I will answer that, your Honor, by (417) reading line 67 of page 2 of the Doughty patent, where it is stated:

"The color will depend upon the particular pigment employed which may be other than metallic in character."

The patent is not limited, therefore, to metallic inks, but extends to any other inks, depending upon the color you want.

The Court: "Various changes may be made in the details of the invention without departing there from or sacrificing any of the advantages thereof."

Mr. Byerly: Such statements usually attach, your Honor, but if this is illustrating what the patent describes I think it should follow the teachings of the patent and make the kind of ink we are talking about.

Mr. Free: Oh, it is indeed. In speaking about the color he states the color will depend on the particular pigment employed. This is yellow pigment. The patent is not limited to gold, or anything else, so we have selected yellow because that is the color described by Gessler, and we want to show the comparison all the way through.

The Court: Well it will be accepted with the limitations pointed out by counsel. Objection overruled.

(Defendant's Exhibit T for identification (418) received in evidence.)

The Court: Would you describe this ink as a metallic ink?

The Witness: The one I made, your Honor?

The Court: Yes.

The Witness: No, that is not a metallic ink.

The Court: Where did you get a description of it in the patent then?

The Witness: I used the yellow pigment all the way through. You will notice that, because the Gessler patent describes yellow, and rather than have any question as to why there is a difference here I took a chrome yellow through all my experiments. I have, however, ink made with aluminum.

The Court: Do you have that here?

The Witness: Prints of that ink, yes.

The Court: You could not make those experiments with it?

The Witness: No, sir.

Q. You do not have any made up? A. I do not have any made up.

The Court: How would it act if you did have it?

The Witness: It would be just the same; about the only question here is whether or not the solvent will evaporate with heat, and terpineol evaporates with heat.

(419) The Court: What is this, with terpineol?

The Witness: On one side with terpineol, and on the other side with butyl carbitol. On one side you will have metallic pigment or chrome yellow or black or red.

The Court: Whether it is a metallic pigment or not would not make any difference?

The Witness: Not a bit of difference, not a particle of difference, because that stays in the binder.

Q. You were asked about metallic pigments, and you stated that you tried out some. I show you a card——

Mr. Free: Which I mark for identification as Defendant's Exhibit V.

(Marked Defendant's Exhibit V for Identification.)

Q. —and I ask you, Mr. Taylor, to describe what is on that sheet, with particular reference to the silver-looking samples there. Tell me what they are made of (handing to witness). A. You mean the silver inks or all the inks?

Q. Begin with the silver inks. A. The silver inks are made in accordance with the Doughty patent. I used 40 parts of terpineol, 10 parts of rosin and 100 parts of aluminum pigment.

Q. That is a common metallic pigment, isn't it? A. That is a common aluminum metallic pigment.

(420) Q. Having made up those inks in accordance with the Doughty patent, as you described, what did you do with them on this sheet? A. I mixed the inks, ground them, and printed these proofs, and dried them myself.

Q. Describe how you did it, and what happened, particularly the drying of it. A. Well, after printing these on a small proof press I placed the samples in an oven and dried them in a matter of a few seconds at 150 degrees Centigrade, and then, as we determined in the court, by rubbing my finger over the print they were all dry, showing that the terpineol had been evaporated completely, leaving the binder and pigment on the paper.

Q. In doing so did you notice a smokelike vapor coming off the paper, like we had here? A. In all cases you got a smokelike vapor.

Q. What is that? A. That is solvent, leaving the pigment and binder.

Q. On the paper? A. On the paper.

Q. I notice on this sheet also, over in the righthand corner two ink formulas, Nos. 71 and 73, and I ask you what they are (handing)? A. No. 71 ink formerly was

made with—the solvent is butyl carbitol, and No. 73 ink, the solvent is terpineol.

The Court: Do you know the difference between them?

The Witness: The proportions are the same.

(421) Q. Those also were made as you described, and the heat drove off the solvent in that way? A. Yes.

Q. They were dry after that? A. They were both dry.

Q. I refer you to the Doughty patent again, line 16 of the first column of page 2, which reads:

> "I have also discovered that certain higher boiling liquid saturated paraffin hydrocarbons, e.g., those present in fractions of kerosene boiling above 250° C. at normal pressure may be employed instead of terpineol."

I would like to ask you whether you have tried out an ink made up of a solvent made from kerosene as described and how it worked? A. I made an ink as described, and as far as the working qualities of the ink, the body and the printing qualities and the drying, it was comparable to terpineol or butyl carbitol.

Q. Tell us how you made up that sample of ink from this kerosene fraction? First tell us how you obtained the kerosene fraction. A. Taking a sample of ordinary kerosene, about a quart of kerosene, I distilled in a simple laboratory still that portion of the kerosene which boils below 250 degrees Centigrade. The fraction remaining in the still which boils over 250 degrees Centigrade, I used as my solvent for ink tests, in (422) accordance with the Doughty patent.

Q. Then with that fraction that you took you made up an ink? A. I did.

Q. According to the description in the Doughty patent? A. I did.

Q. Can you show us samples of the results of such ink, referring particularly to Defendant's Exhibit B for identification? A. Ink formula 75 was made with the solvent kerosene fraction, boiling 250 degrees Centigrade and over, 50 parts, and H resin 40 parts. This made the varnish. Using 10 parts of this varnish I ground into this 23 parts of chrome yellow pigment. I printed proofs with this ink and dried them by the same method that I used with the terpineol inks and butyl carbitol inks, and found that they dried in the same length of time and gave a very good ink which does not rub.

Q. Those samples are shown as you identified them on this card, Defendant's Exhibit V for identification, which you just referred to? A. They are.

Q. Included in that is a metallic pigment ink marked 75-D? A. Yes, there is a metallic pigment made with aluminum pigment. The formula I believe is exactly like that written in the Doughty patent—40 parts of kerosene solvent, 10 parts of H resin, 100 parts of (423) aluminum pigment.

Q. That is the example given in lines 38 to 42 of page 2 of the patent, is it not? A. That is right.

Mr. Free: I offer in evidence as Defendant's Exhibit V the sheet identified and described by the witness.

Mr. Byerly: I object to the exhibit as being merely prints made in some kind of a proofing press and being made ex parte. I think it has no probative value. The witness's testimony of what he did is already in.

The Court: I think it illustrates his work.

(Defendant's Exhibit V for identification received in evidence.)

Q. Now, Mr. Taylor, in obtaining this petroleum solvent mentioned in the Doughty patent which you have just de-

scribed, how did you go about it, can you show us a picture of the apparatus that you used? A. I have a picture of such apparatus.

Q. These photographs which you have shown me are an ordinary laboratory still? A. This is a simple laboratory still.

Q. And the apparatus there shown was used to distill the ordinary kerosene to get petroleum solvents, as you just said? A. It was.

(424) Q. Do you remember in doing so the plaintiff's attorneys, Messrs. Byerly and Watson were present? A. Plaintiff's attorney Mr. Watson was there.

Q. Mr. Byerly had gone home, I take it? A. Mr. Byerly had gone to New York.

Mr. Free: I offer the photographs merely to illustrate the still used by the witness to obtain the petroleum fraction mentioned in the Doughty patent.

(Marked Defendant's Exhibit W.)

Q. With that petroleum fraction which you obtained as described in accordance with the requirements of the Doughty patent, you ran some vapor pressure tests of it on the apparatus shown in Exhibits L-1, L-2 and L-3, did you not? A. I did.

Q. Do you have the results of the vapor pressure tests which you obtained at that time? A. I do. I have them before me, and they are marked Exhibit A-A.

Mr. Free: That Exhibit A-A is the exhibit that was used at the deposition and we will change that to Exhibit X.

(Marked Defendant's Exhibit X.)

Q. These figures were noted down by you when you ran the apparatus in the presence of plaintiff's counsel, were they not? A. They were.

Q. I now show you Defendant's Exhibit O for (425) identification, and ask you whether you plotted on that curve the vapor pressure data obtained and shown on Defendant's Exhibit X? A. I plotted this curve of the data obtained on Defendant's Exhibit X to show, primarily, how close the tests made before the plaintiff's counsel checked with tests that I had made previously to their arrival in our laboratory.

Mr. Free: I offer in evidence Defendant's Exhibit O for identification.

(Defendant's Exhibit O for identification received in evidence.)

Q. That chart shows the curves for the kerosene or petroleum fraction you have just described, and the oil of cloves lying between butyl carbitol and defendant's 502-C, does it not? A. It does.

Q. Will you read the vapor pressure from that curve at 100 degrees Centigrade for all four of those curves? A. The butyl carbitol at 100 degrees is 6 millimeters. The kerosene fraction distilled at 250 degrees Centigrade, at 100 degrees Centigrade is 4½ millimeters. The oil of cloves at 100 degrees Centigrade is 3.3 millimeters. The 502-C oil of Sinclair-Carroll at 100 degrees is 2 millimeters.

Q. Will you do the same for all four curves at 150 degrees Centigrade? A. At 150 degrees Centigrade butyl (425a) carbitol is 69 millimeters; the kerosene fraction distilling above 250 degrees Centigrade is 48 millimeters; the oil of cloves is 33 millimeters, and the 502-C oil is 20 millimeters.

Q. Now, do you have a sample of the petroleum fraction which you distilled in the presence of the plaintiff's counsel, as described in the Doughty patent? A. I do.

(Adjourned to January 21, 1943, 10:30 a. m.)

(426) New York, January 21, 1943;
10:30 o'clock a. m.

TRIAL RESUMED.

CLINTON TAYLOR, resumed the stand.

Direct examination (continued) by Mr. Free:

Mr. Free: If your Honor please, I find I neglected to offer this little tin of Lefferts and Stevens ink yesterday, which was tendered by the witness, and I woul like to offer it in evidence now as Defendant's Exhibit Y.

Mr. Byerly: Your Honor, I object to that. It has the formula on the box which is quite different from the formula given in the Lefferts and Stevens patent. You see, this sample of ink which he has just produced has a formula on the top of it which I assume, although he has not said it, is the formula under which the sample was made. Now that is not the formula contained in the Lefferts and Stevens patent.

Mr. Free: We passed all that yesterday, your Honor, when the witness explained that the ingredients are the same as in Lefferts and Stevens. As Lefferts and Stevens says, you vary the portions wherever (427) necessary to get the viscosity you desire. That is what the witness said yesterday.

The Court: Is there any testimony that that ink would react under the test the same as if it were made exactly in accordance with the Lefferts and Stevens patent?

Mr. Free: Yes.

Mr. Byerly: There is no testimony that I can remember to that effect, your Honor.

Mr. Free: Then I will ask the witness a question about that.

Q. In the Lefferts and Stevens patent which we talked about yesterday there are given the ingredients shown on this container which I offered as Exhibit Y.

The Court: Are you telling him or are you asking him?

Mr. Free: I am asking him the question if those ingredients aren't there, to save time.

A. These ingredients in my formula are to be found in the Lefferts and Stevens patent.

By the Court:

Q. Whereabouts in the patent? A. On page 1, column 2, line 53:

"First, a solvent or a mixture which is a solvent of pyroxyline."

(428) Q. Do you use that? A. Yes.

Q. Then "Second, a pigment or coloring material in powdered form." A. That is chrome yellow pigment.

Q. You use that? A. That is right.

Q. "Third, a gum, gums, or binding agent for holding the particles of pigment together." A. Yes, sir. I use one-half second nitrocellulose, which is a pyroxyline binding agent.

Q. Is there anything else in there not named in the patent? A. Yes: I use castor oil as my plasticizer, which is given on page 2, at line 11.

Q. The first definition on page 1 does not call for a plasticizer, does it? A. No, it does not.

The Court: What do you say about that?

Mr. Free: Well, if your Honor will turn to page 2, line 11, he says, in the first column:

"Castor-oil may also be added to assist in the operation of the gum or gums used as a binder, which further serves to render the ink smooth."

You can add it or not, if you want.

The Court: You mean add it to the other stuff?

Mr. Free: Yes.

The Witness: To make it complete.

The Court: What do you say to that?

Mr. Byerly: There are two formulae given in (429) this Lefferts and Stevens patent. If your Honor will look at page 2, the middle of the second column, it gives an exact formula for plate-printing and on the top of the first column of page 3 he gives a formula for type printing. This formula here is not the same as either one of those. If he wants to say that this is an ink made up from some of the ingredients of the patent, that is one thing, but to say that it is made up in accordance with the patent it seems to me is improper to have as an exhibit here.

The Court: Well, the first page says:

"The ingredients entering into the compound are"——

that certainly is a description of what the patentee had in mind, isn't it? Is that what you are speaking about?

Mr. Byerly: Yes. He mentioned these ingredients, but when he comes to tell how he compounds them he tells specifically how, and the witness has departed from those instructions given on the specific formulas in the patent.

Mr. Free: I think I get Mr. Byerly's thought. I think you mean the proportions may be a little different.

Mr. Byerly: Yes.

Mr. Free: Well, Lefferts says on page 2, column 2, about line 88, your Honor:

(430) "The proportionate quantities of the ingredients used in compounding the ink will depend somewhat upon the nature or character of the printing to be done and upon whether the ink is to be used in plate-printing, type or surface printing."

He can use any proportions he wants.

The Court: He allows a variation.

Mr. Free: Surely.

The Court: I will take it.' Objection overruled.

(Marked Defendant's Exhibit Y.)

By Mr. Free:

Q. Yesterday, Mr. Taylor, at the close of the session I asked you to produce a sample of the petroleum fraction boiling over 250 degrees Centigrade which you made in accordance with the Doughty patent; and you have so produced it here, have you not (handing to witness)? A. Yes This is the sample which you have in your hand.

Q. State whether or not this is a sample of the fraction obtained in the presence of plaintiff's counsel? A. That sample was obtained in the presence of plaintiff's counsel and sealed in their presence.

Mr. Free: I offer in evidence as Defendant's Exhibit Z the sample of high boiling petroleum fraction obtained according to the Doughty patent.

(431) (Marked Defendant's Exhibit Z.)

The Court: What do you call that, an ink?

Mr. Free: No, that is a solvent.

The Court: Just a solvent?

Mr. Free: A petroleum solvent that Doughty describes.

The Court: And where does he describe that?

Mr. Free: That is on the second page, your Honor, at line 16.

The Court: All right.

Q. Now, Mr. Taylor, to give the Court the opportunity of comparing the accused defendant's 502-C oil, shown in Defendant's Exhibit V, with the high boiling petroleum fraction described in the Doughty patent, shown in Defendant's Exhibit Z, will you please break the seals of these two exhibits and compare a little of each in test tubes. By the way, these exhibits were sealed at Cincinnati in the presence of plaintiff's counsel? A. They were.

I now break the seal on the kerosene fraction boiling above 250 degrees Centigrade.

The Court: You mean on the defendant's product? What is that exhibit, Exhibit Z?

Mr. Free: That is the Doughty oil, Exhibit Z, yes, your Honor.

(432) The Court: What is the other one?

Mr. Free: That is Exhibit V, the 502-C oil.

The Witness: I have here two clean test tubes and then in one tube I pour the Doughty kerosene fraction boiling above 250 degrees Centigrade and mark that tube Z. In the second tube I pour a portion of the defendant's 502-C oil and mark this tube V.

Q. Will you hold them both up to the light so that the Court can see the physical color and characteristics of them? A. (Witness complies.) Note the colors are identical, a pale straw yellow.

Q. The kerosene which you distilled Exhibit Z from, was what color? A. A water-white.

Q. Do you know what caused the change of color to straw color? A. The heating causes a change to a light pale yellow in the distillation.

Q. And that is also true of the 502-C oil, is it? A. That is true of the 502-C oil.

Q. Now, I will ask you to pour those samples back in the bottle. A. (Witness complies.)

Mr. Free: I do not think I will mark them in evidence. They are merely taken from the containers.

The Court: What is the value of that, to show that they are alike?

Mr. Free: Yes.

(433) Mr. Byerly: I am willing to concede that the two samples appear similar in color.

Mr. Free: I am simply trying to show that the prior art solvent and our solvent are at least physically alike.

Q. Where did you get the kerosene of which you took a sample by distilling according to the Doughty patent? A. We received this tank car of kerosene from the Pure Oil Company.

Q. Do you have an invoice to show that you obtained it there? A. I do. I got these invoices out of our regular files at the office.

Q. What is the practice in your plant in connection with the purchase of kerosene? A. We buy kerosene in tank car lots according to the market price.

Q. What is the procedure? A. The superintendent of the factory when the kerosene is running low simply sends in a blank order marked "kerosene", and the purchasing agent buys the kerosene from any reputable oil company, depending on the best price.

Q. That is the ordinary commercial kerosene? A. That is the ordinary commercial kerosene.

Q. You took this purchase order and the Pure Oil Company invoice out of the files yourself? A. I got them myself.

(434) Mr. Free: I offer them in evidence as Defendant's Exhibit A-1, the invoice and this order, identifying the kerosene used by the witness to make the solvent according to the Doughty patent.

The Doughty patent says here on this page, line 16:

"I have discovered that certain higher boiling liquid saturated kerosene hydrocarbons, for example those present in fractions of kerosene boiling above

250° C. at normal pressure, may be employed instead of terpineol."

Q. With this fraction of kerosene that you obtained according to the Doughty patent, of which Exhibit V is an example, what can you say about the distillation range of that sample? A. After obtaining this sample of kerosene, the next step was to make certain tests, and the first test was the distillation range. That is according to the A. S. T. M. method.

Q. What is that, briefly? A. That is the American Society for Testing Materials. They have set up a standard method for testing petroleum products. This standard method which I used is used throughout the world, so that a chemist testing kerosene, for example, in New York, will have comparable results with a chemist in some other part of the country.

(4359) Q. What apparatus did you use to determine the distillation range of this Exhibit V substance?

The Court: What is the distillation range?

Q. Will you explain that, Mr. Taylor? A. If you take, for example, three ounces, we will say, of kerosene and place it in a flask and heat it with a slow burner until the first drop starts off, and then take the temperature with a thermometer at that boiling point, and continue the distilling until all of the material has evaporated from your flask, the temperature will continue to rise, and that is known as the distillation range. Kerosene, for example, will start to distill at, we will say, 150 degrees Centigrade, and then the last drop will go out of the still at approximately 300 degrees Centigrade, and that range from 150 to 300 degrees Centigrade is the distillation range.

The Court: What is the difference between that and the vapor pressure?

The Witness: The vapor pressure is the pressure which volatile solvents exert on a closed chamber to evaporate, and the distillation range is the range which shows whether the liquid boils off, we will say, at a low temperature or a high temperature, and is a method of comparing the two liquids.

The Court: What does it prove if the distillation (436) range and it are the same?

The Witness: We have here a kerosene which Doughty taught us to make. In order to determine the properties of this kerosene fraction, we had to run certain tests upon it which we had previously made upon butyl carbitol. One of the tests is the distillation range, another is the vapor pressure.

Q. The idea being to compare the vapor pressure and the distillation range of this Doughty solvent with others, like the defendant's solvent, is that right? A. That is correct.

Q. And also with butyl carbitol? A. That is right.

The Court: Suppose they are the same or different, what does it prove?

Mr. Free: We are trying to show that insofar as this Doughty kerosene fraction is concerned that is the same as our 502-C, which is also a kerosene fraction. The patent in suit sets up certain standards of vapor pressure, and the plaintiff has injected boiling range, or distillation range, in this case, so we are comparing the two of them side by side to show what we used was what was authorized by Doughty.

The Court: What the patent anticipated?

Mr. Free: That is right.

Q. Will you refer to that chart and give me the (437) distillation range of the 502-C oil?

Mr. Free: For the time being I will mark that chart for identification.

(Marked Defendant's Exhibit B-1 for identification.)

A. The distillation range of 502-C oil, first 5 c.c. distilled, starts off at 264 degrees, and the final distillation 291 degrees Centigrade.

Q. What do you make that, Mr. Taylor, at the tail end there? A. It is just a small fraction above 290 degrees Centigrade.

Q. Will you read off the distillation range of the Doughty oil, which is marked 250 oil there, and give us the beginning and end of the range as you determined it? A. The first 5 c.c. reading at 243 and the 95 c.c. reading at 285.

Q. Will you read off also the oil of cloves distillation range shown on this chart? A. Oil of cloves starts 242, the first 5 c.c., and the 95 c.c. oil of cloves 273 degrees Centigrade.

Q. Will you look at butyl carbitol and read off the distillation range of that? A. We have two samples of butyl carbitol marked on the chart, the fresh sample from the Hilton Davis drug, opened in the presence of the plaintiff's counsel, and the sample I received from (438) the plaintiff, from their New York office. The first sample starts at 228, the Hilton Davis sample, and the last 95 c.c. temperature is 231. The sample I received from the plaintiff starts at 225 approximately and ends at the same point as the Hilton Davis sample, namely, 231 degrees Centigrade.

Q. State whether or not the boiling ranges of the Doughty kerosene fraction and oil of cloves are higher than the boiling range of butyl carbitol? A. It can be seen by the chart that they are higher than butyl carbitol.

Mr. Free: I offer in evidence as Defendant's Exhibit B-1 the distillation range chart previously marked for identification.

(Defendant's Exhibit B-1 for identification received in evidence.)

Q. Just to illustrate the apparatus with which you made these tests, which I believe you called A.S.T.M. tests, will you produce a photograph of it? A. (Witness produces photograph.) I have before me the photograph of the standard equipment used for an A.S.T.M. distillation range test.

Mr. Free: I offer in evidence for illustrating the apparatus used by the witness a photograph of the apparatus just produced by the witness, as Defendant's (439) Exhibit C-1.

(Marked Defendant's Exhibit C-1.)

Q. I believe you also said you measured the vapor pressures of the various solvents mentioned by Doughty, and I ask you to show us a chart indicating the vapor pressures at various temperatures, which is marked for identification Defendant's Exhibit D-1.

(Marked Defendant's Exhibit D-1 for identification.)

A. (Producing chart.)

The Court: When you say the Doughty patents, are you referring to more than one patent?

Mr. Free: That should be corrected. Please note for the record that the exhibit should omit patent No. 1,439,695, and I accordingly strike out that number from the chart.

Q. Tell us how you went about obtaining the vapor pressures of these substances shown on this chart, Exhibit D-1 for identification, and to save time you might compare it with the method you used with the Lefferts and Stevens chart. A. I used the same method of determining these vapor pressures that I used in making the Lefferts and Stevens chart, namely, the Brewer and Gardner method. That is the one specified in the Gessler patent. These solvents on this chart are, namely, benzyl alcohol, benzyl acetate, terpineol (440) and butyl carbitol and terpinyl acetate. The vapor pressure of those solvents I have marked under their titles "G" and "B", meaning those determinations were made by Brewer and Gardner.

Q. Will you refer for a moment to Brewer and Gardner and tell us how you checked your results with those of Brewer and Gardner? A. Using the same type of equipment, I checked all of these vapor pressure determinations made by Brewer & Gardner and found that my equipment and their readings checked.

Q. Now I wish you would read off this chart——

Mr. Free: Which I now offer as Defendant's Exhibit D-1.

(Defendant's Exhibit D-1 for identification received in evidence.)

Q. —the vapor pressures of the solvents lying between butyl carbitol and the accused oil, Defendant's 502-C oil at 150 degrees Centigrade. A. At 150 degrees Centigrade we have butyl carbitol at 62 millimeters; terpinyl acetate at 56½ millimeters. The kerosene fraction which I distilled, the vapor determination on that at 150 degrees is 46 millimeters.

Q. How about 502-C oil? A. 502-C oil at 150 degrees is 20 millimeters.

Q. That is, the vapor pressure of terpinyl acetate and (441) the Doughty kerosene fraction is on the order of centimeters, is it not? A. It is.

Q. All you have to do is convert the millimeters into centimeters? A. Vapor pressure readings are given in millimeters.

Q. Now will you read from this chart and give the vapor pressure of the terpinyl acetate and the Doughty kerosene fraction at 100 degrees Centigrade? A. I beg your pardon, did you say terpinyl acetate and kerosene?

Q. That is right. A. Terpinyl acetate at 100 degrees Centigrade has a vapor pressure of 4¼ millimeters. The vapor pressure of 502-C oil at 100 degrees Centigrade is approximately 3 millimeters.

Q. I ask you to compare in the Brewer and Gardner article, referred to in the patent in suit, the curves of butyl carbitol and terpinyl acetate, and do so by means of a chart which I now show you——

Mr. Free: And which I will have marked for identification as Defendant's Exhibit E-1.

(Marked Defendant's Exhibit E-1 for identification.)

A. This chart is an enlargement of the vapor pressure chart given in "Industrial and Engineering Chemistry", February 1937, in an article of Brewer and Gardner, page 180. The original chart which I enlarged was a vapor pressure curve of butyl carbitol. The black (442) dots to be seen on the chart are Brewer and Gardner's calculation for terpinyl acetate. The purpose of this chart is to show that terpinyl acetate and butyl carbitol lie so closely together in vapor pressure that it would be practically impossible to draw a separate curve for either one of the two solvents on the same chart. In other words, they have identical vapor pressure. One will evaporate at the same rate of speed as the other.

Q. Is there a difference between the curves of butyl carbitol and terpinyl acetate as shown in the Brewer and Gardner article? A. There is no difference. You will note

in the article that two separate charts are given, a chart for butyl carbitol and a chart for terpinyl acetate.

Mr. Free: I offer in evidence as Defendant's Exhibit E-1 the terpinyl acetate-butyl carbitol curve described by the witness and obtained from Brewer and Gardner's article.

(Defendant's Exhibit E-1 for identification received in evidence.)

Q. Mr. Taylor, I now show you a print from what purports to be a Montgomery-Ward catalog and bearing your name, your signature, and the date 11-18-42——

Mr. Free: And which I will have marked for identification as Defendant's Exhibit F-1.

(443). (Marked Defendant's Exhibit F-1 for identification.)

Q. —and ask you what you know about it (handing to witness). A. The purpose of this printing—heretofore I have made small proof prints of Lefferts and Stevens ink, the Doughty ink. Then after that we decided we would make a trial run on a standard, large heat-set printing press. These are sheets from our standard run made on such a press.

Q. What ink was used in printing that circular, if you know?

Mr. Byerly: Your Honor, I object unless it is shown that the witness was present at this test. He has not said that, as I remember.

(To witness) Do you have any personal knowledge of it?

The Witness: Yes.

Q. Tell us the whole story, Mr. Taylor. A. I went to Chicago with formulas for inks to be run on heat-set presses in accordance with what I had learned from the prior art.

I went to the Sinclair and Carroll Ink Company and with the aid of Mr. Carroll and their ink matcher we made up four colors: A yellow, a red, a blue and a black, using the knowledge that I had gained from the Doughty patent and from the McElroy patent.

(444) Mr. Free: That is McElroy No. 1,450,692 in Defendant's Exhibit G, your Honor.

The Witness: That is correct, your Honor.

A. (Continuing) I saw these materials selected and weighed and the varnishes made and the inks ground. I was there when the materials were sealed. I followed the materials to the Hall Printing Company, and watched the inks when they were opened and put in the fountain on the press. I was there during the complete run of the inks and stayed with the operation until all of the forms had been printed, and at the completion of the day's work we signed these copies as marked in the right-hand corner.

Q. That is, your signature? A. My signature.

Q. Now describe the press in a little more detail. A. The press was a standard heat-set four-color press of the largest type used in the industry, and at that time the press was in actual operation printing these forms (indicating) for the Montgomery-Ward Christmas Catalog. When we came into the pressroom they cleaned the press thoroughly of the ink they were then using and put on our ink on a clean press and continued with the same paper that they had been using on the Montgomery-Ward Catalog, and went right ahead with their printing using this ink compounded with terpineol, Cumar resin and (445) rosin-oil.

The Court: This is the Doughty ink?

The Witness: Yes, the Doughty and McElroy ink.

The Court: What is McElroy?

Mr. Free: McElroy is patent No. 1,450,692 in Defendant's Exhibit G, your Honor.

The Court: Is that another one of these patents?
Mr. Free: That is another one, yes, your Honor.
The Witness: McElroy adds a plasticizer.

Q. Now you mentioned Cumar as a resin. What is that and where do you find it in the McElroy patent? A. I find that in the McElroy patent on page 2, line 23——

The Court: 23?
The Witness: From line 20 on. He says:
"With 84 per cent of this mixture we incorporate 16 per cent of powdered coumarone resin, e.g., that known under the trade name of 'Cumar'."

Q. What is "Cumar"? Is it a synthetic or natural resin? A. It is a synthetic resin made in the coal-tar industry. McElroy found it a better resin to use than rosin inasmuch as in this heat-set it does not (446) go through a sticky period.

By the Court:

Q. How can you make up an ink from the two patents? Don't they differ a little? A. Very little.

Q. Which was which that you used in printing this Montgomery-Ward Catalog, Doughty or McElroy? A. This was—I would say the McElroy patent, which is an improvement over Doughty.

Q. You made up an ink, then from the McElroy patent, and that is the result? A. That is the result. We ran it on a standard heat-set press.

Q. How many colors did your say there were? A. Four colors.

Q. Black, red, white and—— A. Black, yellow, red and blue on a white heat-set paper.

Q. Where is the blue? A. Right here (indicating).

Q. Well, each color is put on a separate roll? A. Yes.

Q. Put on separately?

By Mr. Free:

Q. Will you describe how that operation is as you witnessed it in Chicago? A. Yes. Each color is put on separately. The yellow goes down, then the blue, then the red and then the black, one following the other on the coats.

(447) The Court: The paper does not have to go back through——

The Witness: No, it runs right through the web. May I point to the diagram (indicating)?

The Court: Yes, I remember that.

Q. They all go one on top of the other, you mean, and one after the other; then, after the ink is applied, the web is run through that heater? A. Yes, and that is just the way they came out, perfectly dry, non-rubbing and free of all odor.

Q. About how many of these Exhibit F-1s were run on that day that you witnessed at Hall's? A. We ran off 18,000 signatures. We ran from one o'clock until about three, I believe, and the Hall Company were perfectly willing that we keep right on through the rest of the day. We felt that the test was successful and I recommended that they shut the press down.

Q. Was there still some ink left? A. We had some ink left and could have run right on through the rest of the day.

Q. What was the condition of the ink in the fountain? A. The ink was in good condition and was cleaned from the fountain and put back in the kits.

Q. What do you mean by "kits"? A. Ink buckets.

The Court: What is the date of this test?

(448) The Witness: November 18, 1942.

Q. Were these signatures in addition to yours, namely, Kerley, Carroll and Maxwell, put on in your presence? A. They were. Mr. Kerley is in charge of the inks at the Hall

Company; Mr. Carroll, of course, worked with me on making the inks, and Mr. Maxwell is in charge of the pressroom, the heat-set pressroom.

Q. Did you get an impression or do you know about the size of the Hall printing plant where this test was conducted? A. I went through the Hall printing plant. I will say that it is the only time I have been there.

Q. How big is it, about? A. Well, the Hall Printing Company is an enormous plant. It covers, I would say, several square blocks. They are printers of Montgomery-Ward catalogs, Sears-Roebuck catalogs and that type of printing.

Mr. Free: I offer in evidence the circular just identified by the witness which he saw printed as Defendant's Exhibit F-1.

The Court: It will be admitted.

(Defendant's Exhibit F-1 for identification received in evidence.)

Q. Now the rosin-oil referred to in the McElroy patent, which is not mentioned in the Doughty patent, I believe, serves what function in the ink with which (449) this Montgomery-Ward circular was run? A. The rosin-oil has a boiling point of about 285 degrees Centigrade, and it served as a double purpose in this heat-set ink. A portion of it was evaporated off as a volatile oil and some tailings remained as a plasticizer in the ink.

Q. And that is to keep the ink soft and not brittle? A. Keep the ink soft and plastic.

Q. And that rosin-oil which did not remain in the ink after it was dried had gone off with the terpineol? A. That is correct.

Q. As the paper was heated? A. Yes, sir.

Q. Did you notice whether or not those heaters on the Hall presses have a hood for carrying off the vapors? A. They do have a hood. I made a special note of that because

during the time we were watching they cleaned the presses and we had some time for discussing the operation of the press, and their press foreman showed me where the vapors were taken out of the building through ducts, normal ventilating ducts.

Q. And did you notice whether or not the ink that was so used fits this description in McElroy, line 33 of the first column, page 2:

> "The ink resulting is of pasty and semi-fluid consistency, similar to that of printing inks generally."

(450) A. That is what we made.

Q. State whether or not you observed this operation to have been conducted at Hall's, as stated in line 99 of the second column of page 2 in the McElroy patent:

> "As will be obvious, however, the ink set forth may be used at lower temperatures, or cold, and the impression artificially dried thereafter."

Was that carried on? A. That was carried on, the artificial drying.

Q. The ink was cold in the fountain? A. Cold in the fountain; passed over the printing rollers and then through the standard gas drier.

Q. Now, Mr. Taylor, will you turn to the Jirousek patent in Defendant's Exhibit G, and I would like to ask you——

> The Court: What patent is that?
>
> Mr. Free: The Jirousek patent. That is the last one in the book I believe, your Honor.
>
> The Court: 1,954,627?
>
> Mr. Free: Yes, sir.

Q. ——and I invite your attention particularly to line 27 of page 1 where it states a paraffin wax is added "although other waxes, as beeswax, Chinese wax, spermaceti, etc. may

be used." And again, on line 62, page 1, second column, (451) he mentions paraffin wax. I would like to ask you what effect the addition of waxes has on the solvent in an ink of this type, heat-set type. A. The addition of a small amount of wax of, say, one-half or one per cent of paraffin wax to the solvent used in heat-setting will slow up the drying to a considerable extent and give the ink a longer press life.

Q. What do you mean by that? A. Simply that if we use a rather low boiling solvent, one that is, for example, lower than butyl carbitol, in the class of toluol, if we should use those inks on a printing they would tend to dry and become gummy on the inking rolls. The addition of a small amount of wax to that solvent will increase the press life tremendously.

Q. What would the addition of wax do to a fast-evaporating solvent? A. To a fast-evaporating solvent, for example, like benzine, the addition of a small amount of paraffin wax will hold that solvent in a fluid condition for sometimes as much as an hour or more.

Q. Have you some way of demonstrating that? A. I do. I have——

The Court: We will take his word for that. Is it necessary to do that?

Mr. Byerly: I think perhaps he had better go a little further, your Honor, because the conditions (452) make a difference.

The Court: All right.

Mr. Free: It is just a quick simple test, your Honor. It will take a minute or so.

A. I have a test tube here which contains a mixture of solvents used by Jirousek, namely, cellosolve 50 parts, toluene 50 parts. In the second tube I have added to the cellosolve and toluene a one-half part of paraffin wax. I would like to demonstrate the difference in the rate of evaporation of these two mixtures of solvents due to the addition of paraffin wax to one of them.

The Court: The wax is in one of them now, isn't it?

The Witness: Yes, the wax is in it.

The Court: In which one?

The Witness: In this one (indicating).

The Court: Well, what are you doing now?

The Witness: This is something that is well known in the printing art, that the addition of wax to a solvent slows up its evaporation rate, and I would like to demonstrate that.

The Court: Well, is that disputed?

Mr. Byerly: Yes, we dispute it.

The Court: Very well.

(453) Mr. Byerly: I mean, we think it requires certain detailed explanation. I do not know that your Honor wants me to go into it now.

Mr. Free: That is why I am doing it, your Honor, because he is objecting to it.

The Court: Very well.

A. To identify the spots of solvent that I placed on the paper, I mark them as they are marked on the tube. The first tube is toluol and cellosolve, which I put on the left-hand side.

The Court: It hasn't any wax in it?

The Witness: This has no wax.

A. (Continuing) On the second side I place the solvent which contains a little wax.

Q. Now I wish you would time the evaporation rate of both of them. A. (Demonstrating.)

Q. You are now waving the paper through the air? A. I fan the paper, of course, to speed up the operation, which has an equal effect on both solvents. It can readily be seen that there is quite a difference, by observing the speed or the rate of evaporation (handing exhibit to Court).

The one on the left——

The Court: That has the wax?

The Witness: That has the wax.

(454) The Court: Then if there is a slow evaporation, that is the one with wax?

The Witness: Yes. That is what you want in printing ink for a long life on a press.

The Court: Show it to the two gentlemen over there.

(Exhibit handed to persons referred to.)

The Witness: The solvent containing no paraffin wax is now practically dry and the solvent containing paraffin wax just smears. It shows very little sign of evaporation.

Q. What time did that occupy? A. According to my watch it took approximately two minutes.

Mr. Free: I think we will leave this sheet of paper out in the air for a while and look at it again later.

The Court: Are you marking that as an exhibit?

Mr. Free: I think there will be nothing left, your Honor, in a day or so, so I think it will be just a demonstration sheet, unless you want to mark it, Mr. Byerly.

Mr. Byerly: No.

Q. Mr. Taylor, yesterday the Court asked you about the solvent of the McElroy patent; will you show whether (455) or not they are solvents for certain resins?

The Court: What is that?

Mr. Free: I thought you asked him whether these Lefferts and Stevens solvents were solvents for resins, and I would like to show you that they are.

The Court: If he says so that will be sufficient.

Q. Now, I would like to ask you to make another demonstration predicated upon the statement which Mr. Bragdon for the plaintiff made, which reads as follows, at page 77 of the record:

"Q. Would you call water and alcohol similar or dissimilar insofar as vapor pressures are concerned? A. I would say they are in about the same class. They would evaporate at about the same rate when exposed in an open vessel."

Do you agree with that statement? A. I do not.

Q. Will you demonstrate what you mean by your disagreement with that statement? A. In order to demonstrate the difference in the rate of evaporation of alcohol and water I take a piece of ordinary hand paper toweling and using ethyl alcohol which I have in a small bottle here, pure grain alcohol, and water in this glass. On one side of the toweling I place some drops of water. I place them on first and give them all the advantage I can of the time of evaporation. (456) On the center of the sheet I place drops of alcohol.

Q. Now, will you time this period and tell me what you are doing? A. Wave this sheet in the air to get a relative rate of evaporation between water and alcohol. I find that the alcohol is evaporating from the paper quite rapidly.

The Court: How do you find that, by its getting dry?

The Witness: By its getting dry.

Q. The alcohol is dry and the water is still wet? A. Yes.

Q. During what period of time? A. That took about 45 seconds.

Q. What causes that difference in evaporation rate? A. The difference is due to the difference in the vapor pressure of the two solvents, water having a lower vapor pressure than alcohol. Water has a vapor pressure at room temperature I believe of 17.6 millimeters, whereas alcohol at room

temperature is 40 millimeters. Alcohol has over twice as great a vapor pressure as water.

Q. What is the difference between the vapor pressure of defendant's 502-C oil and butyl carbitol at 150 degrees? A. At 150 degrees the defendant's 502-C oil is 20 millimeters, whereas the plaintiff's butyl carbitol is in the neighborhood of 60 millimeters at 150 degrees.

(457) Q. The difference is about the same as that between alcohol and water? A. The difference is even greater than between alcohol and water.

Mr. Free: Now, your Honor, yesterday during the discussion of the Lefferts and Stevens patent the question arose as to the substantial identity between the clove oil now and in 1888, so I have obtained here a photostatic copy of the United States Pharmacopoeia for 1882 and a photostatic copy of the same book for 1942, and I would like to read the description of clove oil, first from the 1882 volume of this dictionary.

"Oil of cloves. A volatile oil distilled from cloves. A pale oily thin liquid, becoming darker and thicker by age and exposure to air, having a strongly aromatic odor of cloves, and pungent and spicy taste, and a slightly acid reaction. Specific gravity about 1.050. It is very soluble in alcohol. With an equal volume of a concentrated solution of potassia it forms a semi-solid mass."

In 1942 the same book describing oil of cloves, states:

"Oil of cloves is a volatile oil distilled with steam from the dried flower buds of"—there is a long Latin name I cannot pronounce. Under the (458) heading, however, of oil of cloves the specific gravity given is not less than 1.038 and not more than 1.060 at 25 degrees Centigrade. I would just like to point out that the specific gravity in 1882 was 1.050, which lies well

within the range specified in 1942 of 1.038 and 1.060. The 1942 statement goes on to say:

"Oil of cloves soluble in two volumes of 70 per cent alcohol," and so forth.

I offer in evidence pages 316 and 317 of the 1942 Pharmacopoeia of the United States of America, and page 235 of the 1882 volume of the United States Pharmacopoeia, jointly, as Defendant's Exhibit G-1. I ordered the fly-leaf of each of these but they did not come. I would like permission to add those to the exhibit, because they bear the dates.

(Marked Defendant's Exhibit G-1.)

(Short recess.)

Mr. Free: In further reference to the clove oil test which Mr. Taylor made in accordance with the Lefferts patent, I would like to ask him where he bought the clove oil for that purpose.

The Witness: From Fritzsche Bros., Inc. of New York.

Q. What does that U. S. P. mean on the label? A. That stands for U. S. Pharmacopoeia, which is——

(459) The Court: I know what that is.

Mr. Byerly: Your Honor, in connection with this evaporation of water test, I would like to note on the record, if your Honor will permit it, that during this test the windows of the courtroom were covered with water on the inside, that is, condensed water vapor from the air in the room.

The Court: I noticed that.

Q. Did that make any difference in the evaporation rate of water or alcohol, Mr. Taylor? A. It should not make enough difference to be noticeable. I think we all know that when we come out of a shower covered with water it takes a long time for the water to evaporate, and when we take an alcohol rub-down, as fast as you are rubbed down the

alcohol evaporates from your body. That is just a common sense relationship there.



defendant's accused oil, the 502-C oil? A. The solvents in Lefferts and Stevens have a vapor pressure higher than defendant's solvent 502-C. All of these oils have a higher vapor pressure that defendant's solvent at 150 degrees Centigrade.

Q. State whether or not that would be manifested by the curves of Exhibits P and D-1 for the Lefferts and Stevens and Doughty patents? A. On these two sets of curves plainly it can be seen that the vapor pressure for 502-C particularly is lower than all of the volatile oils mentioned in the prior art patents.

Q. Does the shape of those curves indicate the action of the solvent as the ink is heated? A. Yes; these curves you might say nest one within the other. You will always notice in vapor pressure curves that they have the same general degree of rise in vapor pressure with the temperature.

(463) Q. Is there anything peculiar about that? A. There is nothing peculiar about it. It is a definite law of pressure against the temperature.

Q. Which of the prior art patents which we have discussed here this morning discloses a solvent which forms a stable solution with the resin? A. The prior art solvents which form stable solution with the resins, in Lefferts and Stevens we have oil of cloves and oil of sassafras and oil of cassia. There are three good examples; and nitrobenzole in Lefferts and Stevens. In Doughty terpineol is a very good solvent and makes a very stable ink, as well as benzol alcohol, although I prefer terpineol.

Q. State whether or not you have tried out these solvents with resins to ascertain that they form stable solutions with the resins? A. I have tried all of these solvents, made laboratory solutions with these solvents using nitrocellulose and various resins, to see that they made stable solutions.

Q. Now, I would like to refer you to the Lawrence patent No. 1,858,673 in Exhibit G, and ask you whether

that patent refers to anything which might be called an ink? A. It is an ink.

Q. A transfer compound is a form of ink? A. A form of an ink.

(464) The Court: What do you mean by transfer?

Mr. Free: That is what the patent is called.

Q. Will you describe that, Mr. Taylor? A. A transfer is a rather thick——

The Court: You do not call it an ink, just a transfer? By transfer you mean transfer ink?

The Witness: A transfer printed on cloth, or on paper to be transferred to cloth by means of heat impression.

The Court: You mean they use a cloth as a printing medium in place of a roller?

The Witness: When they put names of teams on sweaters or things like that, they use transfer inks. It is a special type of ink.

Q. Line 33 of the first column of page 2 mentions a formula. Will you tell us after reading that formula what you would get when you mix up those parts? A. Reading from page 2, column 1, line 30, 100 parts of ethyl cellulose, 90 parts of high melting cumar——

Q. Right there, that is some synthetic resin we have been talking about. A. That is one of the cumar resins. Those two ingredients would form a binder. 45 parts of butyl carbitol, 75 parts of ethyl abietate (or Lindol, which is a trade name), and 35 parts of No. 6 lithographic varnish. The ethyl abietate with the varnish would form (465) a plasticizer. The butyl carbitol, of course, would be a solvent. That forms what we have been calling a varnish.

Q. Does any pigment go in that? A. The color is added later.

Q What do you get when you have done all that? A. You mean after adding the color to the varnish?

Q Yes. A You get a waxy, buttery like compound.

Q Comparable to ink or not? A Comparable, you might say, to a thick base ink that would have to be thinned with more solvent.

Q Suppose you thinned it with more solvent, what then would you get? A I think it would be butyl carbitol.

Q That is the solvent he mentions there? A That is right.

Q And would you add more or less solvent as we have heard here for the last several days to get a thick or thin one depending on what you wanted? A That is correct. When you break down the formula that is mentioned with the binder, you will find that the Lawrence binder contains the following as compared with the binder which

[illegible]

Clinton Taylor, for Defendant—Direct.

Q. Now, will you look at the next Lawrence patent, No. 1,954,450 in Exhibit G. There on page 2, line 22, he mentions butyl carbitol again, which he describes down further in line 30 by its chemical name, diethylene glycol monobutyl ether, having a boiling point of 222. Will you look at that formula and tell us what you would get when you mix that up? A. As in the previous mentioned Lawrence formula, you would have a thick wax like paste. The following are alike, that is the Strasser formula and the Lawrence formula, in so much as they both use butyl carbitol as a solvent.

The Court: The application?

Mr. Free: Yes, just to show that the patent as issued is substantially the same as it was filed in the Patent Office.

The Court: What difference does that make?

Mr. Free: You go to the application. Particularly is that so when the application, as this one was, is co-pending with the patent in suit. The idea merely is to show there was no change, substantial change, unless Mr. Byerly is willing to grant that.

Mr. Byerly: It is stipulated that the specification of Jirousek patent application Serial No. 606,081 as filed in the United States Patent Office April 18, 1932 is the same as the specification of United States patent No. 1,954,627 which issued on said application.

Cross examination by Mr. Byerly:

Q. Mr. Taylor, is this catalog which you produced as part of Exhibit D, that is the Carbide & Carbon Chemicals Corporation catalog of January 1929, on page 13 where butyl carbitol is described, is there any (469) mention of using it either in a lacquer or in an ink? A. Yes, in a lacquer.

Q. Where do you find "lacquer" in that publication? A. Pyroxylin dopes I would term as a type of lacquer.

Q. Would you also call a plastic, which he refers to, a lacquer? A. No, I would not. I think that is something a little thicker than a lacquer.

Q. You notice, however, he says pyroxylin dopes and other plastics, so he evidently considers a dope a plastic, does he not? A. You think of a dope as being a very thick lacquer.

The Court: Do you mean that the man who wrote that felt it was a plastic?

The Witness: That I don't know.

Q. It does say, however, pyroxylin dope and other plastics? A. He does say it, yes.

Q. If you put a nitrocellulose solvent, poured some of it on a piece of celluloid, what happens? A. You will get some solution. It will dissolve.

Q. It will dissolve the celluloid? A. That is right.

Q. This Lefferts patent you have been talking about is directed particularly to an ink for printing on celluloid, is it not? I call your attention—perhaps you will admit that. A. Celluloid and other solid pyroxylin (470) compounds.

Q. There is not a single mention in the patent of an ink for printing on paper, is there? A. There is not, that I can see right offhand.

Q. Isn't the real point of this patent— A. Pardon me, but at line 90, page 2, column 2, it says, "The ink depends somewhat upon the nature or character of the printing to be done."

Q. Is that a mention of paper? A. No, but the nature of your printing would, well, if you are going to print on paper, that would give the nature of the printing, I should think.

Q. I call your attention to page 3, lines 41 to 51, where the inventor endeavored to explain what he really had done. You notice there, do you not, that in referring to the solvent he says that his ink contains a solvent or mixture which is a solvent of the pyroxylin compound, upon which the ink is applied? Page 3, lines 41 to 51, where he says what he has invented. A. Yes.

Q. That is, he says he has invented an ink for printing on pyroxylin compounds, which contains a solvent for the compound that the ink is printed on, is that correct? A. That is correct.

Q. Do any of his inks contain solvents for paper? A. No, they do not. We referred, however, to lacquers (471) and cellophane at the time we brought out this Lefferts and Stevens patent.

Q. But what Lefferts was trying to do was to get an ink which contained a solvent which would penetrate into and hold on to the material he printed on, is that correct? A. That is correct.

Q. Are you familiar with the printing or stamping on celluloid by means of engraved heated plate? A. I have seen it done, yes.

Q. That is not typographic printing from type, is it? A. Just how do you mean? You could have type heated or the type could be—you could be printing from type.

Q. Do you know what the plate printing referred to in this patent meant in 1888? A. Hardly.

Mr. Free: I would like to object to this line of questioning on two grounds. The first one is that this is a patent for an ink, and when we get into processes or paper and how we are going to do it, we are talking about something which is stated to be explicitly in the patent in suit to be another invention. He says the method of printing, line 28 of the second column on page 2, the "method of printing is not claimed herein, as it forms the subject matter of my co-pending application Serial No. 15,944 which is in part a continuation of this application". So when you talk about what you are going (472) to use the ink for, that is immaterial. The second objection I have is that the patent in suit is not limited to printing on paper, because he says in line 33 of the second column, page 2, "The novel ink and process described above are not only capable of utilization in printing upon paper, but they are also adapted for use in making very satisfactory prints upon many other surfaces, such as, for instance, textiles or metallic surfaces, or the lacquered surfaces of cellophane or the like where the production of a satisfactory print has heretofore been much restricted".

The patent therefore is not limited to printing upon paper and the plaintiff is estopped at this stage of the proceedings from trying to limit it to a paper ink. He says, "My ink may be used on anything". I cannot think personally of anything he has omitted here. He says, "paper, cloth, lacquered surfaces, cellophane, metal" and so this line of cross examination——

The Court: Whereabouts in the patent is that?

Mr. Free: At line 33, page 2, column 2.

The Court: The objection is overruled.

Q. I was asking you, Mr. Taylor, whether you were familiar with the process of printing on celluloid with a heat engraved die? A. I am not.

Q. I call your attention to the first paragraph (473) in the second column of page 2 of the Lefferts patent, where he says, about half way down that paragraph:

> "In using this ink for printing from engraved plates we prefer to employ heat and pressure, which are applied to the plate and material, the effect being that the ink partially penetrates the surface of the material."

That is a reference, is it not, to printing with an engraved plate which is heated and pressed hard against the material? A. That is right.

Q. And when he refers to the ink penetrating into the celluloid, that is the action of the solvent in the ink on the celluloid in dissolving the material it is printed on, is that right? A. That is correct.

(474) Q. You will notice a little further down that column, beginning around line 95 he gives a specific formula for plate printing. A. Line what?

Q. Well, starting at line 94. You see there the specific formula for plate printing given in this patent? A. Yes.

Q. That formula contains fusel-oil and wood-spirits, does it not? A. It does.

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it should be. It should run off the chart and not be able to be read.

Q. Look at your Exhibit Q. Will you admit that that is correct? A. That is correct.

Q. And that also shows— A. I would like to have you give it to me.

Q. —the vapor pressure at room temperature.

Mr. Byerly: Do you have one that the witness can use?

Mr. Free: Yes. Here is this one (handing).

Q. Defendant's' Exhibit Q also shows that at room temperature, 20 degrees, the vapor pressure of nitrobenzole is at least ten times that of butyl carbitol, isn't it? A. That is right. This chart shows that correctly.

Q. These other substances referred to in this passage to which I referred, lines 33 to 37, are what are known as essential oils or perfumes, are they not? A. They are (478) essential oils from plants.

Q. They are used as perfumes and medicines, and that sort of thing? A. They are used in medicines and that sort of thing, not in perfumes generally. They are essential oils from plants.

Q. They have a strong characteristic odor? A. They have the strong characteristic odor of the plant.

Q. And they are unsaturated aromatic compounds, are they not? A. They are aromatic compounds, unsaturated.

Q. And their composition is not that of a chemical substance but a mixture of various things, is it not? A. Oh, they are definitely a chemical substance. Each one has its chemical oil. Oil of cloves is a chemical substance probably 85 per cent used. They are a slight mixture, the same as hydrocarbons.

Q. That is, they are mixtures? A. Yes.

Q. They are not pure? A. They are not pure. They are U. S. P. substances.

Clinton Taylor, for Defendant—Cross.

Q. The fact that they have strong odors shows in itself that they evaporate, something comes off of them at room temperature, does it not? A. Naturally. That is true of 502-C oil and butyl carbitol.

Q. Butyl carbitol has very little odor, has it not? A. It has odor of a butyl compound.

Q. In this Pharmacopoeia for some time in the 1880's, (479) which you produced, oil of cloves is said to be "A pale yellow thin liquid, becoming darker and thicker by age and exposure to the air." A. That is right; that is what it says.

Q. That indicates to a certain extent it is unstable on exposure to the air, does it not? A. Well it does not give anything in time. We have no idea of what they mean by the time it would take. If we put it on the shelf and allowed it to stand for years it might break down.

Q. You said something about oil of cloves producing a stable solution with some resins, did you not? A. Yes, stable with any ink I made up.

Q. That is something you did not ascertain from Lefferts and Stevens, did you, because Lefferts states in the first column of the second page, starting at line 54:

> "Oil of cloves may be employed in an ink for use in plate-printing, and combines readily with the other ingredients, but after having stood a length of time exhibits this tendency to separate."

Do you find that tendency in oil of cloves to separate from the other ingredients to which the patent referred? A. You will find a slight tendency of the oil to flow above the top of the ink. This is true of linseed oil, butyl carbitol and most any type of oil in this simple (480) type of formula that I made up.

Q. Now Lefferts goes on to say:

> "When such substance, or other substances exhibiting a like tendency, is employed, castor-oil and

wood-spirits should be omitted and the fusel-oil used in greater proportion."

You see that, do you not? A. I have never been able to find your place. You give the page after the column. Would you give the page first?

Q. On page 2, first column, line 60. A. Yes, I see it.

Q. In other words, the patent distinctly says that oil of cloves is not to be used unless fusel-oil is used with it, does it not? A. There is a tendency that way, but I think that what he has in mind, if you are going to store an ink over a long period of time, he wants you to be careful, that is all.

Q. Well for some reason, at any rate, he leaves oil of cloves out of his list of preferred solvents, does he not? A. He does. You remember I used oil of cassia in my ink, not oil of cloves. I was aware of this.

Q. Now, you made up two inks purporting to be in accordance with this patent, didn't you? A. I made up some inks, and I brought two of them with me.

The Court: We will adjourn until 2:15.

(Recess to 2:15 p. m.)

(481) AFTERNOON SESSION

CLINTON TAYLOR resumed the stand.

Cross examination resumed by Mr. Byerly:

Q. In the Lefferts patent, on page 2, the first column, lines 33 to 37, are all the solvents there referred to as equivalents or interchangeable? A. How would you mean that?

Q. I mean does the patentee indicate any preference for one or the other, or does he list them all as equivalent for his purpose? A. He indicates a preference.

Q. After mentioning his preference, then he lists a number of solvents, doesn't he? A. Yes sir; he lists a number of solvents.

Q. So that his preference does apply to all of them? A. I beg your pardon?

Q. Does he indicate a preference between the different solvents which he lists as preferred solvents? A. Yes, he lists in his preference oil of cassia.

Q. Where do you find he says that? A. He has, for instance, oil of cassia in line 25. He mentions that, and describes that more fully than any of the others.

Q. Does that make you think he prefers oil of cassia to the others? A. He seemed to have that on his mind. That would be my interpretation of his solvents, listed under his solvents.

(482) Q. Would you get the idea from reading this patent that any one of these preferred solvents would work for his purpose? A. You simply take these solvents and go ahead and try them out and select one you like.

Q. You think he simply opens a field for experiment? A. No, he does not. He says for preference he uses the solvent. They would all make an ink, but the ink has to be fitted for whatever purpose you want to use it for.

Q. He was talking about an ink to print on cellophane? A. Then you would use an ink that would bite in the cellophane.

Q. Would you gather from his patents that those solvents are all equivalent for his purpose for a cellophane ink? A. In a general way, yes.

Q. And one of those solvents which he indicates to be an equivalent, nitro-benzole, has a vapor pressure about ten times that of butyl carbitol at 20 degrees Centigrade, has it not? A. It does evaporate faster, yes. They all have varying vapor pressures.

Q. Have you ever measured the vapor pressure of any oil of cassia except this that you did for the purpose of this suit a short time ago? A. No, I have not.

Q. You do not know whether that substance as obtained in different years varies in its vapor pressure? A. These oils are essential oils of natural plants, just (483) the same as linseed oil and rosin-oil. We accept them today as being what they were then.

Q. Linseed oil has not any vapor pressure, has it? A. But it is used in ink. I mean we accept them as natural oils.

Q. And natural oils vary from year to year with differences in the plants, and one thing or another, and the way they are extracted? A. Not so you could measure it very well.

Q. Take your Pharmacopoeia on the oil of cloves. What is the method of getting it out of the plant which is described in the 1888 Pharmacopoeia. Isn't that quite different from the method of getting it out of the plant as described in the recent Pharmacopoeia? A. May I have the recent one?

Q. I think the two are together there.

Mr. Free: I think I should say here I did not ask the witness any questions about this, and Mr. Byerly makes him his own witness by doing so.

Mr. Byerly: I think not. It was your exhibit.

The Court: It is your exhibit. I remember we asked him some questions about it.

A. In 1882 it says, "a volatile oil distilled from cloves". In the latest edition of the U. S. Pharmacopoeia it says "Oil of Cloves is a volatile oil distilled with (484) steam from dried flowered buds.". They are both distilled from cloves.

Q. Is not steaming quite a different process from merely distilling it? A. No, steaming is one of the forms of distilling.

Q. It is different from distilling without steam, which can be done, isn't it?

The Court: That is obvious.

A. It says nothing about distilling it without steam, though.

Q. No, but the earlier one does not mention the use of steam. A. I do not know what they used. They may have used steam. Steam is an old method.

Q. It would change the volatility of the substance whether you took it out with steam or whether you merely heated it and distilled it out? A. You would not merely heat the oil of cloves and distill it out. You would burn the plant, probably. You would not just heat a mass of cloves buds, and just heat them up and try to distill them that way. They do not say in 1888. They simply say about oil distilled from oil of cloves. It could be steam distillation, which is a very old method.

Q. There is nothing there to indicate that they used steam distilling in the 1880's? A. No, we just know that they did from——

(485) Q. How do you know that? A. From literature we have read, on special oils, about the method they used.

Q. You have not produced any literature here that indicated how they made oil of cloves in 1888; other than this Pharmacopoeia, have you? A. No, I have not, but I know that to be a fact.

Q. Know what to be a fact? A. That steam distillation was the method that could have been used.

Q. Oh, it could have been used? A. Yes.

Q. Now you spoke of cellophane similar to celluloid. A. Lacquered cellophane.

Q. Oh, cellophane itself did not come into existence until long after celluloid, did it? A. That is correct.

Q. And cellophane is not soluble in these various liquids the way celluloid is, is it? A. I think your patent says lacquered cellophane.

Q. Will you please answer my question? A. No, it is not soluble. The coating, however, is.

Q. Have you ever seen any commercial product known as moisture-proof cellophane? A. Yes, sir.

Q. Is there any nitrocellulose on the outside of it? A. It is lacquered with a lacquer of nitrocellulose very often.

Q. How thick is that? A. A very thin film.

Q. It would not be thick enough for an ink solvent (486) to bite into and take a hold of the way it does celluloid? A. Yes, it is. It can bite into that film. It does bite into it.

Q. If it does bite into it it would take it right off? A. No, it does not.

Q. You tried that? A. Yes. That is the only way we make cellophane inks, to bite into that lacquered film.

Q. You do not know how thick the film is? A. No sir.

Q. Isn't there usually wax in that film, too? A. That I cannot say. That would be up to the manufacturer who makes the lacquered film. There are many moistureproof cellophane manufacturers.

Q. You produced a sample of ink that you called the Lefferts ink, did you not? A. I did.

Q. That is Defendant's Exhibit Y. I notice there is a formula on the outside of the box. Is that the formula from which you made up the ink? A. That is the formula I used for the ink.

Q. And in that formula you say one-half second nitrocellulose, do you not? A. That is right.

Q. When did one-half second nitrocellulose first come into existence? A. The exact date I couldn't tell you; probably around the time of—oh, I would say the 1900s.

(487) Q. Certainly it was long after 1888, the date of this patent? A. It is a pyroxylin, one form of pyroxylin.

Q. But this pyroxylin which did not exist in 1888? A. Yes; it is partly true.

Q. Well what do you mean by "partly true"? A. Well, pyroxylin, the general form of nitrocellulose can be used in lacquer, and there is just a slight variation in viscosity.

There was probably no need for it in 1888, but it probably could have been made.

Q. But it was not made? A. So far as I know; I couldn't state.

Q. Now the specific formula given for an ink near the top of column 1 of page 3 does not include any nitrocellulose at all, does it, of any sort?

The Court: What patent are you referring to?

Mr. Byerly: This is the Lefferts patent, your Honor, page 3, near the top of the first column, where it gives the formula.

The Court: All right.

Q. There is no pyroxylin or nitrocellulose whatever in that formula, is there? A. No, there is not. I did not use these specific formulas. I varied my formulas to fit the press.

Q. What press were you trying to fit with Defendant's Exhibit Y? A. I used a standard proving press used in (488) all printing ink establishments to test out whether an ink has possibilities of printing.

Q. And in order to fit that press you had to introduce this half-second nitrocellulose which came into being after 1888? A. No, I put that in there simply because Mr. Gessler uses it.

Q. I see. You were drawing on your knowledge of the Gessler patent, as well as what you saw in the Lefferts patent? A. No, simply as a pyroxylin type of nitrocellulose.

Q. But a pyroxylin that did not exist at the time? A. That is right.

Q. I notice that his formula calls for camphor. Did you put any camphor in this ink? A. Not in that one, no.

Q. Have you produced samples of the ink with which Exhibit F-1 was printed? A. No, I did not have those.

Q. Will you please produce them?

Mr. Free: He said he did not have any.

A. I don't have the samples of ink.

Q. You know where they are, don't you? A. Not at present.

The Court: Where are they? Do you know where they are?

The Witness: Well they are probably—so far (489) as I know I left them there at the Sinclair & Carroll Company in Chicago.

Q. Those are the offices of the defendant? A. The offices of the defendant.

Q. These are inks which you made up especially to make evidence for this case, are they not? A. They were inks that I made up to try out to see if these prior art patents would run on a modern heat-set press.

Q. And that was for the testimony you expected to give in this case? A. Yes.

Q. But you have never submitted any samples of these inks which you made up for these purposes to the plaintiff, have you? A. No.

Q. What are the formulas on which these inks were made? A. The formulas are on the cards of the Sinclair & Carroll Company, in their office.

Q. I thought you said you made them up? A. I did. I made them up on their standard formula cards. We made up, you see, over 100 pounds of ink. We ran that through as a regular order.

Q. But you did not bring the formulas on which you made that ink? A. No, I did not.

Q. You haven't got them here? A. I simply witnessed the manufacture and the procedure through the plant and the printing and the final delivery of those signatures.

(490) Q. Was any representative of the plaintiff present during this printing? A. Mr. Carroll, I think.

Q. He is with the defendant, isn't he? A. No, the defendant—excuse me, I am sorry—no, no witness for the plaintiff.

Mr. Byerly: Your Honor, I would like to move to strike out Exhibit F-1, as I think it is obviously an ex parte test, and unless the inks, or at least the formulas, are submitted to us it is impossible to cross-examine him about them.

Mr. Free: Ex parte tests are all right, your Honor. He can ask about them all he likes. He said he merely witnessed the mixing of the inks and the running of the inks.

The Court: Do you want him to produce these inks?

Mr. Byerly: Yes, I do.

The Court: Can you get them?

Mr. Free: I will, if they are still in existence. I do not know that, your Honor. I do not know myself right now whether they are or not.

Mr. Byerly: Certainly the formulas are.

The Court: Certainly you ought to have the formulas.

Mr. Free: Yes.

(491) The Court: All right; do that.

Mr. Free: I will; yes, sir.

Mr. Byerly: I still think, your Honor, that the exhibit has not been proved, and in the absence of any information as to the formulas of the inks printed that it is just——

The Court: You renew your motion if they fail to produce it. I will consider it then.

Q. Look at this Doughty patent. Are you familiar with the art of hot stamping book-bindings? A. I have seen it done, yes.

The Court: Hot stamping?

Mr. Byerly: Hot stamping, yes.

Q. It is done with a heated die, is it not? A. That is right.

Q. That is, the heat is applied to the same thing that would ordinarily be the type, the thing that puts the ink on is heated? A. Yes, heated in order to get rid of the solvent.

Q. And it is pressed down. The ink is held down between the heated die and the cloth on which it is printed, is it not? A. So far as I know, yes.

Q. Now Doughty states that the ink which he is making in this patent is particularly for this hot stamping method, does he not? A. Well no, that is not particularly (492) or exactly true, because in the same sentence he says:

> "The ink described, though particularly suitable for book-binders' use, will serve other purposes of decorative printing."

Q. Well that might be stamping gold marks on something besides books, I suppose. That would be decorative printing, wouldn't it?

> Mr. Free: I object to that. He is not competent to answer that question. That is pure speculation.
>
> The Court: Overruled.
>
> The Witness: What is the question?

Q. (Read.) A. Well we don't know. That could be on paper, or fancy books. It is hard to say from this.

Q. Look at the second paragraph of the specifications. We find there a reference to metallic pigment inks. A. What page is that?

Q. That is the first page, the second paragraph of the specification. A. Yes.

Q. There he says that the invention relates "particularly to metallic pigment inks suitable for use in stamping titles and decorative designs on book-bindings". Now in the next paragraph he describes the difficulties encountered in stamping gold book-bindings, does he not? A. Yes.

Q. And on the same page, at line 61, he refers to (493) "application of heat to the type or die", does he not? A. To "permit rapid drying of the ink by the application of heat to the type or die".

Q. And at page 2, the top of the second column, he says:

> "It dries rapidly, however, when applied with a heated die."
>
> The Court: Where is that?
>
> Mr. Byerly: Page 2, the top of the second column, sir.

A. Well, he simply mentions you have to have a volatile solvent to leave your heated die.

Q. Well it indicates that a heated die is to be used? A. In the second paragraph, you left out where he says "for other purposes to which the ink may be adapted".

Q. I show you patent No. 1,460,391 to Sidney Satenstein. Does this patent show a hot stamping machine? A. Method of stamping book-bindings, and the like. I have never seen the patent.

Q. Can you tell by looking at it whether it shows a stamping machine in which the die or type is heated electrically? A. I can see it is a stamping machine. It appears to be heated electrically. I have not read the patent.

(494) Q. This patent is issued to the same company as the Doughty patent, isn't it? A. Both to Alchemic Gold.

Q. And referring to the ink to be used on this hot stamping machine, does the Satenstein patent refer at page 1, line 86, to an application by Doughty? A. It refers to an application by Doughty, Serial No. 521,469, but that is not the same Doughty.

Q. Read his description of what that Doughty application discloses, and see if it is substantially the same as what you found in the Doughty patent.

> Mr. Free: There seems to be no connection with the Doughty patent we referred to this morning here.

I do not see how it is relevant or material. Again, it has to do with method that is excluded in the patent in suit. The patent in suit is for an ink and not for any method.

The Court: Some of these are anticipation patents, I doubt whether they refer to any inks or not.

The Witness: This is a different patent and a different serial number than the one we have before us. I do not know what this patent is for.

The Court: It is pretty hard to hand a patent to a witness and ask him what is in it, if he had not read it.

Mr. Byerly: I think so, but I thought if he (495) read the passage to which I directed his attention——

The Court: Point out to him the change you mean.

Mr. Free: I think Mr. Byerly ought to put the whole patent in, and it would speak for itself.

The Court: Put in as far as your cross examination goes.

Mr. Byerly: I am willing to do that.

(Deemed marked Plaintiff's Exhibit 33.)

Q. In referring to the ink to be used on this hot stamping machine, this patent states:

"Such an ink is disclosed in the co-pending application of Howard Waters Doughty, Serial No. 521,169, and consists in accordance with the disclosure of that application of a metallic pigment suspended in a vehicle which comprises a resinous substance and a high boiling hydro-carbon derivative as a solvent for the resinous substance."

Did you find an ink of that kind described in the Doughty patent about which you were testifying? A. Yes, there

is an ink of that nature. The Doughty patent that I have gives your the right to make various changes in that type of ink, however, just as in the Gessler patent.

Mr. Byerly: I move to strike out these remarks (496) as purely argumentative.

The Court: I think they were called for by the question. The motion is denied.

The Witness: The Doughty patent that I have before me calls for—he gives you a type of formula he is interested in, but he also says that you may make various changes in the details of the invention. Gessler does the same thing in his patent when he gives you one type of formula and then states to you you may make various changes to suit your paper, and Mr. Gessler said that you have to change an ink to fit the paper, to put the press and to fit the conditions under which you are changing. Every ink man knows that, that you cannot take a formula and just simply go into a press room and expect to print it as written. You have to make changes.

Q. And I suppose it is even more true that if you take a patent describing an ink for heat-stamping of book-bindings you cannot expect to take that ink into a print shop and print it on ordinary paper like an ink for that purpose? A. You cannot. It simply teaches you that the solvent used will evaporate from a heated die, which is comparable to a heated piece of paper.

Q. Let us see if that is so. On page 1, line 69, referring to Doughty, he says:

"Preferably the boiling point of the selected (497) medium should be between 200 and 300° C."

Now do you know enough about heat-drying inks used in ordinary printing to know whether every solvent whose boiling point is between 200 and 300 degrees Centigrade

would be successful in such use? A. Down to 200 I would say you were too low. Butyl carbitol is at 222. These are simply lower and upper limits. Between that you would have a range of solvents that could be used in that ink.

Q. But the range would be so broad it would include a lot that could not be used? A. That would depend on the type of press you are using entirely. These things depend on the type of press you are using and the type of printing.

Q. Beginning with line 84, or perhaps line 83, he refers to various solvents, does he not? A. Yes.

Q. After first referring to terpineol, he then goes ahead and says "Other suitable solvents". A. That is right.

Q. You understand from that he means that those are suitable solvents to be used in applying ink with a heated die? A. I simply understand that those are solvents which have boiling points between 200 and 300, which he has stated up above, and now he is giving you a list of those solvents that you might try. Terpinyl acetate has (498) the same vapor pressure as butyl carbitol.

Q. And the others have different vapor pressures? A. They do.

Q. And Doughty draws no distinction between them, does he? For his purpose they are all equivalen ? A. That is for the printer. He is taking this for the type of work he wants to do and how hot his press gets.

Q. I am talking about what the patent indicates. Does not the patent indicate that for whatever purpose the patentee had in mind these solvents are all equivalents that he lists there? A. I do not think you can take that viewpoint.

Q. That is, from later information you have received you think that some distinction should be drawn between the solvents which Doughty mentions as equivalents? A. They all have about the same properties as far as evaporation. Some evaporate slightly faster than others.

Q. In your chart Exhibit D-1 you referred to a number of Doughty solvents? A. That is right.

Q. Is this chart made up like your other charts with curved lines from a chart that had straight lines on it, a logarithmic chart? A. That chart should be read along with the logarithmic chart.

Q. Did you introduce the logarithmic chart of these (499) substances? A. Oh, yes, sir.

Q. I do not like to contradict you, but I do not remember seeing one. If you have it here I should like to see it. A. I have it.

Mr. Free: Well, I thought we did.

Mr. Byerly: Was that introduced?

Mr. Free: I do not think we did introduce it, but we will. We meant to. I will offer it now. You made this chart, Mr. Taylor?

The Witness: Yes.

Mr. Free: From the same data from which Exhibit D-1 was made?

The Witness: That is right.

Mr. Free: I offer that in evidence as Defendant's Exhibit I-1.

(Marked Defendant's Exhibit I-1.)

The Court: Isn't this the one I called attention to, as to the fact that you said "patents" instead of "patent".

Mr. Free: It was the other one. The same thing applies there. We will strike out one of those patents.

Q. Referring to Exhibit I-1, that shows that benzyl acetate and benzyl alcohol have vapor pressures at room temperature at least five times as great as that of butyl carbitol at room temperature, does it not? A. Yes.

Q. And yet, so far as the Doughty patent indicates, (500) without any reference to outside information, those solvents are equivalent to the other solvents he mentions, are they not?

Mr. Free: I think the record ought to show that by "equivalent" you mean the chemical equivalent, not the equivalent in the sense of the legal term.

Mr. Byerly: I mean equivalent in the sense that they are usable for Doughty's purpose, according to his patent, whatever that was.

A. They are usable for his purpose, depending on the type of ink he wants. If he wanted one that evaporates rapidly he would put in benzyl acetate. If he wanted to slow down his evaporation of his solvent he would use terpineol.

Q. That is your interpretation of what he would do. There is nothing to that effect in his patent, is there? A. Well, when he says these various changes may be made that is what people familiar with the art—and they are the ones to read the patents—I assume would naturally do, adjust an ink to fit their conditions.

Q. Look at page 2, line 40, where he tells how to make this ink—4 parts of solvent terpineol or benzyl alcohol, for example. He does not indicate there any preference between one or the other, does he? A. No, he gives you a choice there. He gives you two solvents to use.

(501) Q. When you made up a sample of this ink you selected terpineol, did you not? A. I did.

Q. And that has a lower vapor pressure at room temperature than benzyl alcohol, hasn't it? A. Yes, considerably lower than benzyl alcohol.

Q. Did you make any ink vehicle in the proportions which are given here in the example, that is, 4 parts of the solvent terpineol and benzyl alcohol to 1 part of ordinary resin? A. Yes; when I used metallic pigments I used the exact formula and found it to be very good.

Q. Have you a sample of that ink here? A. No, I have the prints which I exhibited.

Q. It was much thicker than ordinary printing ink? A. No, it was the same consistency as the ink I submitted.

Q. Which was the ink that you submitted? A. Chrome yellow pigment made out of lead is very much heavier than aluminum pigment. The formula had to be varied in accordance with the pigment used.

Q. You have not any sample metal pigment made according to the proportions given in the patent? A. No, I simply say that it made a good print and ran very well in the press.

Q. Did you dry it on a hot die, to see if it would work on that? A. I was not interested in a hot die. I ran it on a typical proof press, and then heat-dried it and drove off the terpineol, just as I did in court.

(502) The Court: Just answer the question.

Q. (Read.) A. No.

Q. Then when you made other inks with a different viscosity you were not seeking to get the right viscosity for use with a hot die, were you? A. No.

Q. You say you have made up an ink, I think in accordance with the McElroy patent, have you? A. Yes.

Q. That is the ink you have not produced here, isn't it? A. That is the ink I have not produced.

Q. I call your attention to the first column of the second page of the McElroy patent, line 46, in which it is said: "However, 20 per cent of 'cumar' to 80 per cent of the solvent vehicle forms an ink which at certain temperatures tends to clog the impression member."

In the inks which you made did you use over 80 per cent of solvents?

The Court: The "impression" is the printing member?

The Witness: Yes. You are speaking of inks I made for the Chicago run?

Q. Did you make any other inks under this patent? A. Oh, yes, for testing I have made several inks.

Q. You have not produced any of them here? A. No.

Q. Have you adhered to this part of the disclosure which calls attention to the fact that there should be at least 80 (502-a) per cent of solvents? A. No, I varied the ink to fit the press.

Q. That is you did just the opposite from what the patent said in this respect? A. I cannot remember exactly what the formula is. When we bring the formula card in we will have that.

Q. But you are pretty sure there was not 80 per cent of solvent? A. I am not sure.

Q. What is the boiling point of terpineol? A. The boiling point of terpineol, I would have to look in the handbook, but it would be less than butyl carbitol. I can not give you the exact figure.

Q. It would be over 200 Centigrade? A. It would be in the neighborhood of 200 Centigrade.

Q. I call your attention to page 2, second column, line 99, in which it is stated:

> "Preferably, therefore, the described composition should be used as an ink at a temperature substantially that of the boiling point of the solvent vehicle."

That means that this ink should be employed with a die heated to something over 200 degrees Centigrade, doesn't it? A. In the neighborhood of that.

Q. And you did not try applying this ink to a die heated to about 200 degrees Centigrade? A. No.

(503) Q. Going back to the Lefferts patent for a minute, have you ever heard of any commercial use of any commercial ink, that is, I mean an ink that is on the market or has been on the market, which has a solvent consisting of any of the substances listed in the Lefferts patent as solvents? A. The only one we use is oil of cloves at the present time in small amounts in printing ink.

Q. Now oil of cloves is used in the linseed oil-type of ink, isn't it? A. That is right.

Q. And it is used as an anti-oxidant, not as a solvent? A. That is right. It is to prevent the ink from drying on the rolls, that is right.

Q. And the linseed oil ink dries by absorbing oxygen, does it not? A. That is right.

Q. And really oil of cloves has been found to delay the oxidization of linseed oil ink? A. Yes.

Q. There is no suggestion of anything like that in the Lefferts patent, is there? A. No, sir.

Q. And that is entirely different from using oil of cloves as a solvent, isn't it? A. Yes.

The Court: Wouldn't the two uses conflict?

The Witness: What do you mean?

The Court: I mean to put it in as a solvent hurries the evaporation?

The Witness: It would help to drive off the (504) vapor.

The Court: And the other use is to use it for what?

The Witness: Keep the ink from drying on the rolls at room temperature.

The Court: If you drive it off with heat then it dries quickly?

The Witness: Yes.

Q. In the ink where it is used as an anti-oxidant it is only a minor portion of the ink, isn't it? A. A small portion.

The Court: If you use it as a solvent you use a much larger quantity?

Mr. Byerly: Yes.

Your Honor, I hope you will pardon me for a minute. This examination was quite long—

The Court: That is all right, take all the time you need.

Q. Now you have referred, in connection with the Doughty patent, to making a kerosene cut, have you not? A. Yes, sir.

Q. And that you base on page 2, line 15 and following? A. Yes, that paragraph.

Q. As I remember it you said this morning—you produced a bill and said this was some kerosene that (505) you had bought in 1942, wasn't it, the kerosene you had used? A. Yes, 1942 kerosene.

Q. How does the 1942 kerosene compare with kerosene used at the time of the Doughty patent? A. 1922?

Q. Yes. A. Substantially they are practically the same. Kerosene was a cut made from petroleum to be used in kerosene lamps. They cut off the higher fraction, the gasoline fraction, so that the lamp would not cause explosions when one would attempt to light it. They cut off the heavier fraction so that the wick would not smoke. Therefore they had a fraction in there known as the kerosene fraction which since 1922 has been changed very slightly.

The Court: The top that they cut off for the gasoline is the volatile part?

Mr. Byerly: Yes.

The Witness: Yes. That would cause an explosion in the chimney if they leave gasoline in the kerosene.

The Court: Yes.

The Witness: That was true back in 1880 or 1870. In order to get rid of the gasoline, before the automobile came into existence, they used to do away with the gasoline—they had to pass a law to get rid of the gasoline out of the kerosene, to prevent fire.

The Court: What did they do with it?

(506) The Witness: They poured it down the sewers, I guess.

Q. How about the other end of the kerosene? A. The upper end?

Q. Yes. A. The heavier oil has been cleaned up a little bit for one reason. The kerosene lamp went out—the major portion of kerosene today is used in incubators. To prevent any smoking of the wick they cut the upper fraction off from the heavier part of the oil; just cleaned the kerosene slightly to prevent any smoking in incubators.

Q. What was the upper end of the boiling range of the kerosene you bought in 1942? A. That was 560 degrees Fahrenheit.

Q. I show you a photostat of a pamphlet published by the Government Printing Office in 1921, effective December 29, 1920—I guess it must have been reprinted in 1921—giving the specifications for burning oils. I call your attention to the item "Distillation" under the specifications for kerosene. It states there that an end point of 625 is allowed, does it not (handing to witness)? A. "It shall not be higher than 625."

Q. And what was your present kerosene? What was the end point? A. 560. They state under 625.

Q. Well, "under"—that is a good 1942 kerosene, but (507) it certainly was different from what the Government specification allowed in 1920, wasn't it? A. This is the upper limit they allowed. In 1922 we don't know how low the companies would cut the kerosene. They may have cut it to 600 or 560 in 1922.

Q. That is something you have not looked into? A. Yes. We have distillation ranges of 1922 showing that the kerosene was cut lower. The distillation range is lower than 620.

Q. Where did you get those ranges? A. We have the books with us.

Mr. Byerly: I will offer in evidence a copy of the pamphlet which I just showed the witness, which is

entitled "Report of Committee on Standardization of Petroleum Specifications, Bulletin No. 5."

(Marked Plaintiff's Exhibit 34.)

Mr. Free: May I hear the question on the book?

(Record read.)

Q. Now I call your attention to another pamphlet marked "Department of The Interior, United States Government Specification for Lubricants and Fuel Oil, Government Printing Office, 1924."

This Government Specification also gives the end point of the boiling range of kerosene. It states, does it not, that the end point "shall not be higher than (508) 625 F." A. Not higher than 625. That is the upper limit.

May I see that again, please?

Q. Yes, surely (handing). A. We are speaking about two different things here. You have here the end point "shall not be higher than 625 F.". The charts I showed you are the distillation range, and I read them at 95%. That 560° F. which I gave is the distillation range. The temperature at which the last 95 c. c. goes off. This photostat of the plaintiff is a final end point where the very last drop leaves the equipment. I am not sure that they are comparable.

Q. You did not determine the end point of your kerosene, then? A. No, I did not. I have used A. S. T. M. methods, and when we reached 95 c. c. of kerosene distilled over, I took that as my temperature, 560° F. It is a standard distillation method.

Mr. Byerly: I will offer in evidence the United States Government Specifications shown to the witness.

Mr. Free: I object to that, your Honor. It does not prove anything. It is too indefinite. It just says the upper limits shall be thus and so. It does not prove what was the limit.

The Court: That does not prove what the limits (509) are.

Mr. Byerly: It shows the progress of the kerosene which this gentleman used over the kerosene which Doughty had in mind in 1922. We shall point out as we go on that it makes a very considerable difference in the vapor pressure.

The Court: Objection overruled.

(Marked Plaintiff's Exhibit 35.)

Q. I now call your attention to a photostat of page 758 of a book entitled "Petroleum" by Sir Boverton Redwood, published in London in 1922. Do you find data as to the boiling range of American kerosene in the upper part of this page (handing to witness)? A. I don't quite understand the question. This simply says "an American oil" here.

Q. The paragraph underneath it says "American kerosene", does it not? I mean, right under the table. A. Yes, I see it. I did not read it.

Q. And the distillation range is given or some indication of it? A. 150 to 270 on the American kerosene.

Q. Is that Fahrenheit or Centigrade? A. Centigrade.

Q. The table indicates, does it not, that on American kerosene No. 1 39 per cent of it boiled above 270 Centigrade? A. Of this kerosene, yes.

(510) Q. And if you had taken a part of this kerosene which boils above 250 Centigrade you would have had a much wider cut than you obtained by distilling the 1942 kerosene at 250 Centigrade, wouldn't you? A. We would have had a slightly wider cut. I think they give 39 per cent. I got about 25 per cent.

Q. 25 per cent above 270? A. Oh, excuse me—when I made my cut, above 250.

Q. Certainly your kerosene was not 25 per cent above 270? A. No. We have no idea where that kerosene came

from. It was given to me. It is one of the American kerosenes.

Q. In 1922? A. Yes.

Q. Now I wonder if your recollection is correct. As I remember it when we were out in Cincinnati you only got 20 per cent over 250 in your distillation? A. Well, I think we made a rough guess at that. I don't remember whether we measured it or looked at the still. We said about 20 or 25.

Q. Now non-uniform material, such as kerosene, with a fairly wide boiling range changes its vapor pressure during evaporation, does it not? A. Yes, when they are distilling.

Q. In this apparatus you used—called the Ramsey and Young—you do some distilling of the material while you are (511) measuring the vapor pressure, don't you? A. Very little. I have a close cut kerosene there.

Q. I was talking about the machine in which you measured vapor pressures, according to the Ramsey and Young method. Is that what you were thinking of? A. Yes. There is very little distilling.

Q. When you were using this machine, shown in Defendant's Exhibit E-3, to measure vapor pressures, the part of the liquid which was distilled off during the measurements was collected in this trap marked E which was surrounded by ice, wasn't it? A. If any liquids had been distilled off it would have been entrapped in the vessel E.

Q. You did not measure the proportion of the liquid which was trapped in that vessel, did you? A. Yes. I opened that vessel and withdrew the liquid that had been distilled over during previous vapor pressure runs and found it to be less than 4 c.c. of liquid in that flask E.

Q. And that related to distillation runs of a number of different materials at different times? A. That was many runs of vapor pressure tests.

Q. So you did not in any one run determine the proportion that was distilled over into the flask? A. I did not. It would be very small.

Q. Then if you were distilling a material with a (512) wide cut on that machine the vapor pressure you would get would be the vapor pressure that that material had before any appreciable amount of it had boiled away or distilled away? A. In the first place I did not take any vapor pressure of any materials with a normal wide cut, if you are referring to kerosene.

Q. I am asking you whether that would be the effect of that method if you did try to measure the vapor pressure of a wide cut material. A. There would be some slight tendency that way. Your wick is constantly wet with new material from the bottom of the tube A, however, and you introduce fresh material—you may introduce it at every reading or before every new reading, if you care to.

Q. Well, what I mean is, what you would be measuring would be the vapor pressure of the material before any substantial amount of it had distilled, is that correct? A. That is correct.

Q. That is, you would get no indication whatever of what would be the vapor pressure of that material after half of it had evaporated, let us say? A. No, you get the vapor pressure of the total material.

Q. Yes. You do not get any indication as to what that vapor pressure is as the material is evaporating? A. No. You get it only as the material recedes, the (513) material that you have.

The Court: I think we will take a recess for ten minutes.

(Short recess.)

Q. Will you now look at the Jirousek patent.

The Court: Which one it that?

Mr. Byerly: I think Mr. Free said it was the last one in the book—No. 1,954,627.

Q. (Continuing) I call your attention to the formula given in the Jirousek patent beginning at line 53 of the first page and ending at line 70 of the first page. Which of the ingredients of that ink are liquid? A. Linseed oil, rosin-oil, kerosene; here is copal varnish, 55 per cent mineral spirits, and 76 benzyl alcohol.

Q. Which of the things in that ink would you call solvents? A. Benzyl alcohol, kerosene and the linseed oil. There are two types of solvents, one volatile and one non-volatile.

The Court: Any liquid is a solvent, isn't it?

The Witness: In a compatible ink formula a liquid is a solvent.

Q. Are not some ink vehicles made of linseed oil and nothing else? A. Oh, yes, sir, linseed oil, yes.

Q. What is the linseed oil a solvent for in those inks? A. In that case there is nothing in there for the (514) linseed to dissolve. There is no resin in there, but it would be a solvent.

Q. But in an ordinary old-fashioned linseed oil ink where you just disperse the pigment in linseed oil, the linseed oil is not a solvent for anything that is in the ink, is it? A. It is a carrier for the pigment.

Q. And the linseed oil eventually oxidizes and hardens itself, doesn't it? It does not leave something else to harden? A. That is correct.

By the Court:

Q. Will an oil as it oxidizes dry out and become thick, or how does it act? A. When linseed oil dries out it becomes in the form of a rubbery film.

Q. It gradually hardens? A. Similar I would say to linoleum. It has flexibility to it.

Q. Will any oil act that way? A. Of the drying oils linseed oil is the most important.

Q. Will olive oil act the same? A. No, olive oil and cottonseed oil are non-drying oils. They do not evaporate, and if allowed to stand on a glass plate they will be sticky for months or perhaps even years after.

By Mr. Byerly:

Q. Referring now to the volatile solvent in the Jirousek ink, do you know what the vapor pressure of that solvent is at room temperature, that is, a mixture of (515) benzyl alcohol, mineral spirits and kerosene in the proportions which he mixes them? A. No, I do not, not in that example.

Q. Would you be surprised to find that it is 290 times the vapor pressure of butyl carbitol at room temperature? A. No.

Q. The volatile solvents, the total amount of them present in that ink, amount to not more than half the amount of linseed oil present in the ink, do they? A. I have not added them up. I do not know. I would have to break that formula down.

Q. I thought perhaps you had done that. A. I do not have it with me.

Q. I have broken it down, but I do not want to give you my figures if you can get your own. A. What is the per cent of linseed oil?

Q. I find 40 per cent of the ink is linseed oil and 21 per cent of it is solvent, is that about what you get? A. What are you calling solvents there?

Q. I am adding together the benzyl alcohol, the mineral spirits and the kerosene, which I think you said was a solvent. A. That is right. Did I mention resin?

Q. I do not know whether you did. There is only 1.7 per cent of resin. Then you do not dispute my statement that the volatile solvents are present in (516) about half the amount of the linseed oil present?

The Witness: Your Honor, should I take the time to break this down?

Clinton Taylor, for Defendant—Cross.

The Court. How long would it take?

The Witness. Oh, a few minutes.

The Court. Well, go ahead and let us get rid of it. You do not care to give him your figures?

Mr. Ricketts. I am perfectly willing to give him those figures.

The Witness. Rosin oil could be a solvent, but in a small manner. I am satisfied with those figures.

The Witness: This paper passes over a hot flame or the like. —

The Court: The ink is stamped onto the paper, and as long as the paper is damp, whether it is with linseed oil or ink or whatever it is, your ink is not dry?

The Witness: It is not dry, no.

The Court: It couldn't help to have the paper.

The Witness: Yes, like in a news ink, all of your oil is absorbed into the paper and none of it dries by oxidation.

(519) on to something else? A. Yes, you have it come off the paper, but when it goes onto cloth, of course, you want it to dry, and you dry it with heat, with an iron.

Q. Both of these Lawrence patents mention butyl carbitol? A. Yes.

Q. Take patent No. 1,954,450, page 2, line 130——

The Court: That is Lawrence?

Mr. Byerly: That is Lawrence. There are two Lawrence patents, but this is the number I gave No. 1,954,450.

Q. At line 130 he gives a number of materials which, for his purpose in making a transfer, he says may be substituted for butyl carbitol, is that correct? At 130 there is a list of materials there? A. That is what he says, yes, that is correct.

Q. Those materials do not all have the same vapor pressure as butyl carbitol, do they? A. No, they all are medium high boiling solvents. They evaporate slowly at room temperature.

Q. Do you know how the vapor pressure of those solvents compares with that of butyl carbitol at room temperature? A. Only the nitro-benzole and the diethylene glycol are the only two that we have been interested in.

Q. The nitro-benzole I think you mentioned that before (520) as being ten times that of butyl carbitol, haven't you? A. That is at room temperature?

Q. Yes. A. At room temperature butyl carbitol does not evaporate, and nitro-benzole evaporates ten times faster than butyl carbitol, which does not evaporate at all. I do not know what that would make.

Q. Did you get the impression that this patentee did not know what vapor pressure was, or did he seem to understand it? A. He evidently understood it, but either he or whoever wrote the patent made some errors in the method of writing up some of his vapor pressure sentences.

Q. In the first column on page 2, about line 72, a high vapor pressure is referred to as causing a slow evaporation, isn't it? A. He calls that a high vapor pressure at 100 degrees C.

Q. So that it does not evaporate with sufficient rapidity, and so forth. In other words, he certainly gives the impression there, does he not, that a high vapor pressure means slow evaporation? A. Yes.

Q. And that is the reverse of the fact, isn't it? A. Yes.

The Court: What does he mean, that that is a solvent for that particular material? Does it mean that some things won't act as a solvent for solid materials?

Mr. Byerly: I presume he means it is a solvent (521) for the particular materials he is using.

The Court: In other words, he limits it to butyl carbitol for that purpose?

Mr. Byerly: I do not think he means that, because in the very next column he gives that list of other materials that may be substituted for it.

Q. How much of your time since you got out of school have you been devoting to printing ink? A. Oh, that is, I would say, 75 per cent of it.

Q. 5 per cent? A. 75.

Q. Oh, 75.

The Court: You mean you have worked in a press-room or in a factory?

The Witness: In an ink factory, making inks for printing companies.

Q. That was in the nature of research work? A. Research manufacture, everything clear through the whole plant.

Q. Does your company sell printing inks? A. We do.

Q. Do you also sell printing ink varnishes? A. We do.

Q. Is this that I now show you one of your recent catalogs? A. Yes, it is 1941, not so recent.

Q. I notice on page 54 of this catalog of your company there is a list of so-called heat-set varnishes, is that (522) correct? A. That is right.

Q. And those are varnishes to be used in this heat-set type of work which the Gessler patent relates to, are they not? A. In a general way.

Q. What is the solvent used in the first varnish referred to there, No. 321? A. There is no solvent given here.

Q. Don't you know? A. I do not know in 1941 what we did put in 321.

Q. Was it butyl carbitol? A. Your Honor, may I say a word?

The Court: Yes.

The Witness: I do not know just how much I should say about these formulas.

The Court: Go ahead.

Q. (Read.) A. That I don't know.

Q. Do you know what the solvent was? A. I am not sure.

Q. You think it was butyl carbitol?

The Court: He said he did not know. A. I am not sure.

Mr. Byerly: He is responsible, I think, for formulating these things.

The Witness: No, I am not responsible for those.

Mr. Free: Hilton Davis is not a party here. That is another company. And what difference does it (523) make what some other company made in the way of heat-set varnishes? I think that is entirely immaterial and irrelevant.

The Court: What do you want to prove by this witness?

Mr. Byerly: I would like to prove that his company is making varnishes for the purpose of making inks that infringe this patent, and is therefore very much interested in the result of this suit.

The Court: You have not made them a party, though?

Mr. Byerly: No.

The Court: Their infringing then is an issue entirely outside of this case.

Mr. Byerly: I think the fact is that one can always show an interest in the case on the part of a witness. If this witness is employed by a company that is interested in the case it seems to me that should be brought out.

Mr. Free: I still think that is immaterial.

The Court: You do not claim any infringement by Hilton Davis, do you?

Mr. Byerly: We have notified them they are infringing, yes.

Mr. Free: Then go on and sue them, but do not (524) inquire in this court about them.

The Court: What is it you wanted to ask him, what kind of a solvent they are using?

Mr. Byerly: Yes, in this ink listed in this catalog.

The Witness: I am not trying to evade that question. It is not that I would not tell you. That is made in the varnish department, and you know how large our plant is, and that is made in a cold cut varnish, and in 1941 before Pearl Harbor—things have changed a lot since then. We do not make those varnishes any more. Those are not in our new catalog.

The Court: Did you ever work in that department?

The Witness: I have done research work for them, correcting formulas and mistakes.

Q. So you have known what their formulas were? A. Not enough to keep them in my mind. I can go to the records at any time and find them.

Q. What did your have these drums of butyl carbitol for out at your plant that you drew the butyl carbitol off for the tests? A. Those were bought, I think the records show, quite a while ago. They are kept in stock. At present we are not using them. I think there were a considerable number of drums, and they have been standing there for six months or more.

(525) Q. Did you buy them before 1941? A. We have the invoice there as one of the exhibits, which gives the exact date.

Q. An invoice for the butyl carbitol? A. Yes.

Mr. Free: Is this it (indicating)?

Mr. Byerly: Yes, has it been put in as an exhibit?

Mr. Free: Not yet.

The Witness: Excuse me, I thought he had put it in evidence as an exhibit.

Q. That, if I read it correctly, shows the butyl carbitol was bought in 1942, doesn't it? A. Yes, in March 1942, about ten months ago.

Q. Were you still making this heat-set varnish, No. 321, when that was bought? A. That I could not say. Those orders go through the order department and are shipped out. If they were made within a day or two after the order is received, I really cannot say.

Q. Have you ever used butyl carbitol as a solvent in the heat-set varnish which you have been selling, for making ink? A. So far as I know we have used very little butyl carbitol in a heat-set ink.

Q. What have you used mostly? A. Mostly petroleum close cut solvents.

Q. In this varnish which you list, No. 321, which you say is a nitrocellulose type? A. No, not that one. (526)

You said which do we make the most of. We make the most of the petroleum close cut, in that we use butyl carbitol acetate.

Q. Then in these four heat-set varnishes that you list together here in your catalog, if I understand you right the first one has a solvent of butyl carbitol acetate and the other three have narrow petroleum cuts as solvents, is that correct?

Mr. Free: I still do not see the relevancy of this. What difference does it make?

The Court: It goes to his motive here in testifying, and affects his credibility and value as a witness, I think.

A. Yes, that is probably butyl carbitol acetate.

Q. Is that a complete answ r to the question? A. These are not heat-set inks. You know, they have to be compounded into an ink.

Q. I call your attention to the paragraph in the catalog immediately preceding the list of heat-set varnishes, and that states, does it not, "For the manufacture of magazine inks primarily blacks, which are to be run on high-speed rotary presses and immediately set by the application of heat, we recommend the following varnishes." That is in your catalog, isn't it? A. Yes, in our 1941 catalog.

(527) Q. Do you know George Nieder? A. Yes, he is our sales manager.

Q. I show you what purports to be a letter from him, will you tell me whether that is his signature?

The Court: Look at the signature and answer the question: is that his signature?

The Witness: I am not sure of the signature. It is our letterhead. I am not sure of Nieder's signature.

The Court: Then say so.

The Witness: I am not sure of the signature.

Q. Look at that letter and see if you have any doubt as to whether it came from your company? A. It is on the letterhead. I have never seen the letter. This is the first time I have ever seen it.

Mr. Free: It looks we are going away beyond the qualifications of this witness, talking about a letter written by somebody named Nieder, and certainly not relevant.

The Court: This is cross examination and I think it is proper.

Q. And in this letter it is stated, is it not, "Attached you will find copy of letter written to you on the above date. This situation still exists, and not until this matter is out of court will we be in position to discuss or furnish any heat-set vehicles." (528) That statement is in the letter, isn't it? A. That is correct.

Q. I show you what purports to be the attached copy. Is there anything about that to enable you to recognize whether that was an enclosure with that letter?

Mr. Free: I would like to note an additional objection. This is just plain hearsay, and I do not know what it adds to the case.

A. This all goes through the Sales Department. I have never heard of it or seen any of these letters. I cannot make any positive statements of any kind.

Q. You do know, don't you, that your company discontinued making these varnishes for the manufacture of quick-drying heat-set inks because they were charged with an infringement of the Gessler patent? A. I did not know that until I saw that letter. That would be purely in the Sales Department, not in the Research.

Q. I did not know whether your position in your company made you aware of those things or not. A. Well, if I wanted to spend extra time I could go into the files and

read those letters, but I have not, that is the truth. Those are all new to me.

Mr. Byerly: I would like to mark in evidence the catalog of the Hilton Davis Company.

Mr. Free: I object to it as immaterial and (529) irrelevant.

The Court: The objection is overruled.

(Marked Plaintiff's Exhibit 36.)

Q. Now, you gave a deposition in this case in Cincinnati, didn't you, Mr. Taylor? A. Yes.

Q. And you referred to some kerosene which you distilled in the presence of plaintiff's counsel in that deposition? A. Yes, sir.

Q. And you said then "We are going to take a gallon of kerosene out of the big storage tank that is loaded directly from the Standard Oil of Ohio delivery wagon." You said that? A. I did, I remember that.

Q. Now, did you testify here or did you not, that this kerosene came from some other oil company? A. Yes, we buy that in the market, depending on the price.

Q. Now, in your deposition you referred to the amount of this kerosene which you distilled off at 250, didn't you? A. Yes.

Q. You said that you were distilling it from a flask that held approximately 1500 c.c. of kerosene? A. Yes.

Q. I will show you this, if you have any doubt. I do not want to confuse you on it (handing paper). Now, on the next page you said there were 280 c.c. left after the distillation. A. That is right.

Q. And if those figures are correct, then the residue (530) which you got after this distillation amounted to about 18½ per cent of the amount you started with, didn't it? A. If you remember, we did not measure the kerosene we poured into the flask. We took about 1500 c.c., guessing from a beaker that held 2000 c.c. We thought it was approximately two-thirds full.

Q. Then there certainly was not more than 20 per cent of this kerosene left in the residue? A. Between 20 and 25.

Q. How do you get 25 out of it? A. Well, we will say 20 then, about 20.

Q. Does your company make up reports of research they have done in the form of this report I now hand you? A. That is their report.

Q. And these reports of yours are usually dated, I suppose, are they not? A. Well, if they are not it is probably a mistake.

Q. There seems to be a date here of June 11, 1934. A. That is correct.

(531) Do you remember your company did some consulting work for the plaintiff in this case at one time, some research consulting work for International Printing Ink Company? A. I knew that they did some kind of work, yes.

Q. And that was in connection with inks? A. That work was all carried on by Mr. Davis.

Q. You yourself personally had nothing whatever to do with this consulting work for International Printing Ink Company? A. Some of it I did, yes.

Q. Oh, you did do it? A. I was thinking of the matter of printing ink. I noticed some printing ink there.

Q. And you do not do any of this consulting work personally for I. P. I. on printing inks? A. I cannot recall whether I did or not.

Q. But you know the work was done by your company for I. P. I.? A. That is right; I do.

Q. Did you have any information as to the problems that you were asked to work out for I. P. I.? A. That I was asked?

Q. Well, that your company was asked to work out. A. No. Mr. Davis carried on all that work.

Q. You did not come in touch with it at all? A. I don't recollect any particular problems of printing inks.

Q. You remember that you were informed at one time your company was informed by International Printing Ink

(532) Company, "that a petroleum distillate so carefully fractionated as to distill within a narrow range, say 190 to 210 C. will make an ink which will give satisfactory quick setting by the application of heat." A. I do not know that.

Q. Now you have heard at some time that one refers to the weather, "This is a good drying day." What does that mean? A. Well, that means there is a breeze, not raining, not misty and not foggy, I suppose.

Q. You have noticed, haven't you, that clothes hanging out on a line dry faster on some days than others? A. That is correct.

Q. When you made this alcohol and water drying test you waved the paper you had them on in the air a little bit? A. That is correct.

Q. What was your purpose in doing that? A. Simply to speed up the test so that we would not be standing up here so long waiting for that.

Q. Yes, but how did that speed it up I want to know. A. Well, by carrying the vapors away from the paper.

Q. You mean if the air over the paper had been saturated or full of the vapors of the material that were evaporating then the evaporation would be slow? A. It would be slower.

(533) Q. That is— A. They were both on the same paper, done at the same time with the same waving.

Q. Yes. Was there any alcohol in the air in this room? A. Of course not.

Q. There was a considerable amount of water vapor, wasn't there? A. I don't know about that. You pointed to the windows at the time, and it is very cold outside, and any moisture in here would condense.

The Court: Is moisture pumped into this room as far as the air conditioning system is concerned—does anybody know?

The Clerk: I don't know, sir.

Q. If it is like any other air-conditioning system it would be, wouldn't it? A. It would.

The Court: Is it humidified?

The Witness: We can make that test in any other room and I think you will find comparable results.

The Court: I noticed in my chamber one window was very wet and the other absolutely dry. The dry one is where the heat comes up.

Mr. Byerly: Yes.

Q. Now what kind of paper did you put these two liquids on? A. I used this toweling, paper toweling I had.

The Court: Mr. Byerly, would you like to have (534) that experiment repeated under your conditions?

Mr. Byerly: I think we will repeat it. I just want to make a record of the conditions under which the witness did it.

The Court: Do you want to repeat it?

Mr. Free: I will offer right now to repeat it under any conditions that Mr. Byerly wants to do it.

The Court: I think that would be the best way if there is any doubt about it. If there is any claim that it wasn't fair you had better repeat it under your conditions.

Mr. Free: I want to settle that right now.

The Witness: I didn't mean it was not fair. I simply wanted you to know that water vaporized very slowly and alcohol with considerably more speed.

Mr. Free: The implication is apparently that that was unfair. Now I want to straighten that out.

The Witness: I did not mean "unfair".

Mr. Free: I suggest that Mr. Byerly name his own weapons so that we can do it the way he wants it done. We are perfectly willing.

Mr. Byerly: I should like to see it done with films—now you may have noticed the alcohol more spread out on that paper than the water——

Q. Didn't you? A. That is right.

(535) Q. So that it was in a thinner film? A. Well, the ideal way would be to put it in glass dishes and wait around—stand around here and see which evaporates first.

Mr. Free: How would it be if we ran a stream down a glass plate side by side?

Mr. Byerly: I think if you put a small drop—the trouble there again is you are faced with the difficulty that comes into this air conditioning system. We are bound to have a considerable amount of water in the room. I think it would be fair to pick some other substance—of which there is a considerable number—which has the same vapor pressure as water, and try that against alcohol. Otherwise to get a fair test you would have to desiccate the air of the room. I think your Honor understands what I mean. There is no alcohol in the air.

The Witness: Well, supposing we take toluol, which has a vapor pressure of water.

The Court: Take what?

The Witness: Toluol, which has a vapor pressure of water.

The Court: You designate what you want to test, and he will bring the stuff here in the morning and make it when court opens.

Mr. Free: I think I would like to insist on it, Mr. Byerly.

(536) Mr. Byerly: Well, I intended to do it myself, and I would be just as glad to have him do it. It is only a question of getting the stuff.

The Court: If there is any doubt about it I think we ought to do it.

Mr. Byerly: Yes.

Mr. Free: By all means, yes.

Mr. Byerly: I think that is quite right. Now the only material I happen to know of is this—what was it, the stuff that we had in the ink that we said had

a vapor pressure of a centimeter and a half? What was that?

Mr. Watson: Secondary butyl acetate.

Mr. Byerly: Secondary butyl acetate. Is that the same vapor pressure as water? I believe it is lower than water.

Mr. Free: Well, let us pick one like water, because water is the issue here.

Mr. Byerly: Yes. The toluol is near to that of water.

The Witness: I think you are right on that.

Mr. Byerly: Do you agree with that?

Mr. Free: Can you get some toluol overnight?

The Witness: I don't think I am able to get it myself in New York.

(537) The Court: Can you furnish that?

Mr. Watson: Oh, surely.

The Court: All right. Bring that in the morning.

Mr. Free: Mr. Byerly, let us see if we can get some overnight.

The Court: If there is any particular kind of paper you want it made on——

Mr. Byerly: I think a thin film on glass or some non-absorbent would probably give a truer picture. Of course your Honor understands that the test is to determine the question of whether Mr. Bragdon was right in saying it evaporated slightly faster, or Mr. Taylor is right in saying it evaporated a great deal faster? We do not for a moment deny that there will be some difference.

The Court: Well, let Mr. Bragdon make his own experiments to show that it evaporates slowly.

The Witness: The question to Mr. Bragdon, of course, was water and alcohol.

Mr. Free: Yes. I think Mr. Bragdon's obligation is to show that water and alcohol do or do not evaporate at the same rate, since that was the question that he gave the answer to.

As far as we are concerned we are willing to use some other substance, like toluol, in place of water, since (538) that has been criticized. Now, Mr. Bragdon's answer is on the record, and there it is.

Mr. Byerly: That is why I felt it part of my case to meet this proof here, but I am perfectly willing to have the witness make a test.

The Court: Do whatever you want about it. Get the substance, and in the morning we will make the test.

Mr. Byerly: Yes. I think that concludes the cross-examination, except for these inks, or the formulas for these inks that were purported to have been used. When they are produced I would like to ask the witness a few questions.

The Court: Can you get those here?

Mr. Free: Your Honor, I have asked someone to telephone to Chicago to get them on, and I don't know when they will come.

The Court: If they send them by air mail it will be here tomorrow.

(Discussion off the record.)

Mr. Free: We will get them here as quickly as we can.

Mr. Byerly: With that reservation, your Honor, I close my cross examination.

The Court: Now, do you want to examine him (539) tomorrow?

Mr. Free: I would like to ask him a few questions, but let us get this toluol and alcohol business straightened out.

The Court: All right, we will do that first.

Mr. Free: And you can go on with your cross examination tomorrow until you are through.

Mr. Byerly: I just said I was finished—oh, you mean on making this test?

Mr. Free: Yes.

Mr. Byerly: I have no objection to asking him questions. I think your Honor will probably ask him questions when he makes the test.

The Court: Yes, I will be interested. Now how many more witnesses do you have?

Mr. Free: About three more.

The Court: As long as this?

Mr. Free: No, I think not. They are short—and a couple of depositions. I thought I might take up one of the depositions tomorrow, because one of the witnesses has not arrived, and that will take up most of the day, I think.

The Court: You do not want to sit Saturday, do you?

Mr. Free: Well, I would rather not.

The Court: I will do whatever is convenient. (539a) We won't have Court on Saturday. We will adjourn until 10:30 tomorrow morning.

(Adjourned to Friday, January 22, 1943, at 10:30 a. m.)

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(540) New York, January 22, 1943:

10:30 o'clock a. m.

TRIAL RESUMED.

CLINTON TAYLOR resumed the stand.

Mr. Free: If you will recall, your Honor, we left it last night that Mr. Taylor would remain on the stand to measure the difference between alcohol and water at room temperature as to evaporation rate. At any rate, the plaintiff wants him to do it and so he is ready for that now.

Mr. Byerly: Your Honor, Mr. Taylor suggested last night this toluol as a substance that was not in the air and had about the same vapor pressure as water. We have some toluol here. We also have some of the liquid used in the ink that Mr. Bragdon had, which was, I think, called secondary butyl acetate, which has a vapor pressure almost exactly the same as water. We find toluol is a little higher than water, about 2 as against 1½, so we will be glad to furnish samples of both of those.

Mr. Free: The question is between water and alcohol. There is nothing like water, and so if Mr. (541) Byerly wants to substitute something else for water that is up to him, but the issue is contained in Mr. Bragdon's answer to the question. He said here, I asked him this question: "Would you call water and alcohol similar or dissimilar insofar as vapor pressures are concerned? A. I would say they are in about the same class. They would evaporate at about the same rate when exposed in an open vessel."

The reason we asked Mr. Taylor to show that they did not evaporate at the same rate was to refute what Mr. Bragdon said here. The criticism was that we did it the wrong way. You tell us how you want to do it and we will do it, but we have looked into this, and we find there is nothing like water except water itself. This morning we tried it out on a glass plate in my office with some alcohol, and my office is steam-heated and is bone-dry, and the same condition happened, the alcohol went off a lot faster than the water. Maybe your Honor's comments yesterday might give us a suggestion. You mentioned the fact that one of your windows was drier in there than the other, and why don't we go in there and put the alcohol and the water on a glass plate and let it evaporate.

Mr. Byerly: I think, your Honor, it is impossible to get a perfectly dry, or anything resembling a dry (542) atmosphere here, and for that reason we suggested last night, and I understood Mr. Taylor to acquiesce, that we should use some liquid which was not in the atmosphere and had the

same vapor pressure. It may not be fair to inject this into the defendant's case. We are perfectly willing to make a test in rebuttal which we think will give your Honor a correct appreciation of the effect of the difference in vapor pressure. We are willing to supply Mr. Taylor with these liquids.

The Court: What was the point of this test originally?

Mr. Byerly: The point of this test originally was in Mr. Bragdon's prima facie testimony. He pointed out that an ink in a thin film would evaporate very rapidly if it, as he said, if its vapor pressure were in the order of centimeters, and he produced two inks and demonstrated to your Honor that they both evaporated rapidly when he set them out in a thin film; and one of those inks contained as a solvent ordinary alcohol which has a vapor pressure of about 4 centimeters at room temperature, and the other contained a liquid called secondary butyl acetate, which has a vapor pressure of about 1½ centimeters at room temperature, and he demonstrated those two. That was our demonstration. Then on cross examination Mr. Bragdon (543) was asked about the evaporation of water, which happens to have about the same vapor pressure as this substance in his ink he demonstrated, that is, about 1½ centimeters, and he said that alcohol would evaporate faster than water but not very much faster, and I think you pushed him a little on that on cross examination, Mr. Free, if I remember rightly.

Mr. Free: His answer that I have is that they did not evaporate any differently at all, that they evaporated at the same rate. He said "I would say they are in about the same class", page 78, "They would evaporate at about the same rate when exposed in an open vessel." The same rate. I proved with Mr. Taylor they did not evaporate at the same rate, and Mr. Byerly objected to that, and all I want him to do is to choose his own weapons and then demonstrate the difference between the rate of evaporation of

alcohol and water. I think if Mr. Byerly wants to prove that, let him prove it on his own case.

Mr. Byerly: I am willing to do that. I think you will find that you have not quite got that right.

Mr. Free: Maybe this is a suggestion. Would it be helpful to your Honor if we put it on a glass plate and took it into your room?

(544) The Court: Why is it necessary to take it into that room?

Mr. Free: I thought it might be drier there, because you mentioned the window being drier.

The Court: One window was drier and one window was just as wet.

Mr. Byerly: If we took it to Colorado I think we would have better success.

The Court: If we took a train for Colorado this afternoon we might demonstrate it and be back by Monday morning.

Mr. Free: I will bet my room is just as dry as Colorado.

Mr. Byerly: This question and answer were in Mr. Bragdon's testimony:

> "Q. Alcohol evaporates faster than water at room temperature, does it not? A. It does.
>
> "Q. And that is because of the difference between their vapor pressures at room temperature? A. That is true."

So that Mr. Bragdon made no contention that they evaporate at the same rate. That would be silly.

The Court: Unless he cares to use water, why, the testimony stands uncontradicted, but if he wants to make a test with something besides water, I think he would (545) be better off. It would allow the water to stand uncontradicted.

Mr. Free: I do not care what he does on rebuttal, because I wanted to point out that anything other than water is not water.

Mr. Byerly. In the first place you have not got the ink formulas yet that we asked for, have you?

Mr. Free. No.

Mr. Byerly: Then I have just a few more questions to ask Mr. Taylor.

Mr. Free: Go ahead.

Cross examination continued by Mr. Byerly:

Q. You put in two charts, Defendant's Exhibit Q and Defendant's Exhibit O, showing some of these substances, did you not (handing to witness)? A. Yes. There are oil of cloves and 502-C oil and butyl carbitol on both charts.

Q. What was the significance of putting in two charts with these materials? I did not quite follow that. A. Chart Q was the original chart I made when running the Lefferts and Stevens test. Chart O simply demonstrates the test that I had made previous to the test made when the plaintiff's counsel was there to witness them, were practically identical as far as the formulae and straight lines on a vapor pressure chart.

(546) Q. That is, you put these charts in to show that two sets of measurements were practically identical, is that the purpose? A. Chart O was put in, as it says, for four solvents as compared to the vapor pressure determinations witnessed by Mr. Byerly and Mr. Watson and checked by Mr. Blackmore.

Q. As I understand it, you put these in to show the two sets of observations gave the same result; not to show they gave a different result, is that right? A. Well, the two charts—I don't quite understand you. When the plaintiff's counsel visited our laboratory and I made tests on vapor pressure of the four solvents, I thought it would be interesting to make a chart, which I did, Chart O, comparing vapor pressure determinations taken in the laboratory not in the presence of the counsel and vapor pressures in the presence of the counsel and see if they compared favorably, and in making this chart you will notice that the points fell right on the same line, approximately.

Q. Then as I understand the significance of the charts, it is to show that the results were the same, substantially the same in those experiments, is that right? A. This large chart, Q, is a chart which was made to go with the charts of the curves that I submitted, another chart on the Lefferts and Stevens (547) test.

Q. Was chart O put in to show that chart Q was wrong or right? A. The chart O was not put in for chart Q. Chart O was simply put in as a check test, and it is made not in your presence, to check with the test made in your presence.

Q. And do they show that these tests gave substantially the same results? A. Yes, sir. You can see they fall line for line.

Q. Now looking at chart Q at 150 degrees that gives a vapor pressure of butyl carbitol of about 6 centimeters, doesn't it? A. Yes. The line falls at about 6 centimeters.

Q. And chart O gives the vapor pressure of butyl carbitol at 150 degrees at about 7 centimeters, doesn't it? A. Chart O gives the vapor pressure of butyl carbitol, about 6 centimeters.

Q. That is nearly 7 centimeters? A. Yes. The line can be varied by those dots. Your points are your determinations, and you have Brewer and Gardner, and any person in drawing a chart makes his determinations and then draws his line as close as possible to that determination.

I might answer that this way: In the Gessler patent the vapor pressure as given, I know, is 60 millimeters, that is, "about 60 millimeters." That was taken (548) from the Brewer and Gardner article which gives a vapor pressure of 66 millimeters if you read directly from the chart.

Q. Well, did you see any significance, then, between those two charts with regard to butyl carbitol? A. No, there is no real difference. You actually read the vapor pressure, the two vapor pressures being within experimental errors that I took in my readings, and that Brewer

and Gardner determined; you used the points on the charts given here in circles and then draw a line through those points as nearly as possible.

Q. I see. Then in your opinion the results shown on the two charts are practically the same? A. They are practically the same, yes.

Mr. Byerly: That closes the cross-examination, your Honor, except for a reservation when they get these samples of inks, in which case we might want to ask some questions.

Re-direct examination by Mr. Free:

Q. Mr. Taylor, in connection with the Doughty patent you will remember the question came up as to the similarity or dissimilarity between kerosene as you tested it to produce the Doughty fraction, high-boiling petroleum fraction, Exhibit Z, and the 1922 kerosene. Was there any difference between the two of them so far as (349) boiling ranges and distillation ranges were concerned? A. They were practically the same.

Q. Do you have anything to show that? A. I have a 1920 edition of "The Technical Examination of Crude Petroleum, Petroleum Products and Natural Gas" by Hamor and Padgett.

Q. Published by? A. McGraw-Hill. It is a Mellon Institute technical series. On page 352 we find there a distillation chart of certain petroleum products, and one of them is domestic kerosene. They give for the first point on the distillation chart at 5 c.c. by the A. S. T. M. method, 165 degrees Centigrade or 329 degrees Fahrenheit; the 95 c.c. point has 295 degrees Centigrade and 560 degrees Fahrenheit.

Q. And how about the boiling range? Is that given there, too? A. The distillation range?

Q. You just gave the distillation range, did you not? A. That is right, the distillation range.

Q. I will now ask you this question: Does that compare with the distillation range of the substance which you obtained for the Doughty patent? A. The kerosene I obtained on the Doughty patent had those identical points. I remember very well that the specifications from the Pure Oil Company for our kerosene was 360 degrees Fahrenheit for the 95 c.c. (550) reading on a distillation range.

Q. I notice on the curve that you have just referred to that it is called lamp oil, domestic. A. Just for the record I would like to read from page 26 of this book where it describes a certain substance:

> "The product is termed natural lamp oil distillate (burning oil distillate or kerosene distillate)."
>
> So what is called lamp oil in 1922 is kerosene.
>
> Mr. Free: I want to offer in evidence photostatic copies of pages 352 and the fly-leaf of this Mellon Institute book published in 1920 as Defendant's Exhibit J-1.
>
> (Marked Defendant's Exhibit J-1.)

Q. Now I think it might be helpful if you could show us in some way, Mr. Taylor, how these close cut petroleum fractions, like 502-C oil and the Doughty petroleum fraction, are obtained. A. I would like to do this with a simple deck of cards that I purchased the other morning. I think it shows very well what we mean when we talk about fractions of crude petroleum and close cut fractions of that petroleum. If we allow a deck of cards to represent petroleum as obtained from the ground and each card to represent a fraction of that petroleum the deck of cards divides (551) itself very nicely into four series. As we know, crude petroleum when distilled, we have the gasoline series which we might represent by the spades.

We have the kerosene series that we have talked about a great deal, which we can represent by the diamonds.

Then we have the fuel oils which we may represent by the clubs, and the heavier oils, the mineral oils by the hearts.

Now the mineral oils and the fuel oils and the gasolines we are not interested in with regard to this cut of kerosene. The cut we are interested in is the kerosene cut represented by the diamonds, and that, just as in a suit of diamonds, is made up of a series of—well, kerosene is made up in a series of hydrocarbons one following the other very closely, just as the cards do in a suit.

Now to make a close cut we may place this kerosene in a still and start to heat it and distill off each fraction. That fraction boiling below 250 would represent about two-thirds of the kerosene, represented here by two-thirds of the deck of the suit of diamonds. The upper portion boiling above 250 would represent only a few cards, or in the kerosene would represent what we have been calling a close cut fraction of kerosene. I think this demonstrates in (552) one way a method of representing the relation of close cut petroleum oils to the wide fraction of crude petroleum, wide range of crude petroleum. We simply take a cut out of one of the series of distillates of crude petroleum.

Q. In other words, you have a column of layers of materials which you call kerosene, and if you want the top fraction you just chop off the upper layer and use that and throw the rest away. Is that right? A. Yes.

Q. Now in reference to the Lefferts and Stevens patent, I would like to ask you whether the pyroxylin compounds referred to therein, such as at line 90 and line 91 of the second column of page 1, include this half-second nitrocellulose? A. It does.

Q. That you were asked about yesterday? A. It does.

Q. I think it might be interesting for us to take a look at some of that stuff and see what it looks like. Do you have some of it here? A. I have some in that envelope.

(Envelope handed to the witness.)

A. (Continuing) I have with me a sample of half-second nitrocellulose or pyroxylin, one of the forms of pyroxylin, which has all the appearance of cotton. It is nitrate of cotton. (Handing to Court.) You will notice that it is treated with mineral oil because it is quite inflammable and dangerous to carry around. (553) I put some mineral oil on it to cut down the inflammability, but the characteristics in appearance are identical to half-second nitrocellulose or pyroxylin.

Q. That is in the class of pyroxylin compounds which is referred to in the Eefferts patent? A. That is one of the pyroxylins.

The Court: Is that referred to as printing upon that?

The Witness: That is the raw material which goes into the solution, the material we speak of as nitrocellulose or half-second cotton or pyroxylin or lacquered cotton.

The Court: Well, he says something about printing upon that. Is that made into sheets?

The Witness: That is made into sheets.

The Court: Just like something by pressing?

The Witness: No. They dissolve that in a solvent and include a plasticizer and then run down into sheets.

Q. And the ink contains the same stuff, a solution of the pyroxylin and the solvent? A. Yes.

The Court: In the ink?

Mr. Free: Yes.

The Court: What happens when the two substances come together, one the ink and one the paper?

(554) Mr. Free: If the ink is printed on paper it sets on top; as the solvent evaporates when heat is applied it leaves the print. If you print with the same ink on pyroxylin for example, on the back of

some of these little celluloid cards that are passed out bearing a calendar, if you print on that, the solvent in the ink is also a solvent of the surface. Some will bite in and some will evaporate as the heat is applied. It works the same way on paper as it does on pyroxylin or celluloid.

The Court: What evidence is there here that it acts the same way on ordinary paper?

Mr. Free: Mr. Taylor demonstrated what he called those draw-downs with pyroxylin ink, and then he put it over the hot plate and the solvent went off.

Q. I wish you would take your copy of the Lefferts patent, Mr. Taylor, and refer to the first column on page 2, line 37, the sentence beginning with that line, and read it and tell me whether those light solvents are necessarily used or are optional? A. Some of the lighter solvents may also be used in confection with the above, such as fusel oil, wood spirits, grain alcohol, and so forth, not only active as solvents but also, it says, to prevent the ink from becoming too thick or adhesive.

(555) Mr. Byerly: Your Honor, I object to his commenting on this passage. It is perfectly plain what it means. I believe he was asked to state whether the inventor of this patent meant them to be used. I think that is a question for your Honor to say.

The Court: I think so.

Q. You were asked yesterday what the boiling point of terpineol is and I would like to have you check that in the dictionary. Do you have one handy? A. In Hack's Chemical Dictionary, Second Edition, page 923, under "terpineol", I find that he gives the boiling point of 219.8 degrees Centigrade.

Q. That is all. Now, there was some reference in your cross-examination yesterday to the Doughty patent being

directed particularly to metallic inks, and I want to ask you whether anywhere in the Doughty patent you find an exception or the contrary? A. That is whether you are allowed to use other pigments other than metallic pigments.

Q. Yes. A. On page 2 of the Doughty patent, column 1, line 1, he says, "The pigment preferable to bronze or other metallic powder." That is just simply his method of incorporating this bronze. Then with that statement about the pigment, on the same page, column 2, in line 67, he says, "The color will depend upon the (556) particular pigment employed, which may be other than metallic in character."

Q. Yesterday you were asked about your knowledge of some varnishes that were listed in the Hilton Davis catalog, and I would like to ask you about how many different products are used by the Hilton Davis Company? A. The Hilton Davis Company has, as far as I recollect, approximately 18 different departments, making a very diversified field, or covering a field of supplies for the printer and the printing ink market and for the paper maker. In those 18 departments we have thousands of formulas, and it is impossible for anyone to try to cover and remember those formulas.

Q. Those varnishes are just one or two products, is that right? A. We have three varnish departments. The lacquer varnishes, of course, are in the cold varnish department.

Mr. Free: Now, Mr. Byerly, I would like to see that Hilton Davis report you asked the witness about yesterday, if you please, sir.

Mr. Byerly: If your Honor pleases, your Honor will remember that I read the witness a few phrases from a report which he said was from Hilton Davis, and he said he did not remember anything about it, as I remember it, and could not identify it; and I question (557) whether that entitles counsel to see the

whole report. I would like to have your Honor's ruling on that. I have it here.

Mr. Free: You just showed him the cover with the Hilton Davis name on it, and you read from the report, and I think you ought to say what the report is about, because you asked him some questions about it.

The Court: What did the witness say?

Mr. Byerly: The witness answered that he did not know anything about the report. He said he knew it was the form of report that they put out.

The Court: If that is true your objection is good. I do not recall just what his answer was.

Mr. Free: You showed him the cover and asked him if he recognized the cover and he said he did.

The Court: Who is the report by, some third party?

Mr. Byerly: I will be glad to show it to your Honor.

Mr. Free: That is what I would like to know.

The Court: His testimony on that did not help either side, so I sustain the objection.

Q. In the course of your work with inks in these sixteen-odd years or more that you mentioned, did you have occasion to use new products as they came out on the (558) market from time to time? A. We do.

Q. And that includes resins? A. Resins, solvents, pigments, dyes. That naturally is the purpose of a laboratory along with a plant, to continually search out for new products to be used in varnishes and inks.

Mr. Free: That is all, your Honor.

Re-cross examination by Mr. Byerly:

Q. This book you put in to give us the distillation range on some American kerosene indicates that the kerosene

which the author of this book examined is different from the so-called typical American kerosene referred to in the book, which I showed you. You remember seeing this book that I showed you yesterday? A. Yes.

Q. Now, I am asking you isn't it evident from this book, compared with the book which you have produced, that the two American kerosenes referred to in these two books had somewhat different boiling ranges? A. The tests are entirely different and it would be hard to compare them. This is a standard American Society for Testing Materials method of testing kerosene. Had they used the same method, we could compare one with the other. This is a percentage method of distillation.

Q. From your knowledge of what this standard method means in the testing given in the book which your counsel produced, would it be possible that this kerosene (559) referred to in Defendant's Exhibit J-1 had a residue of 39.7 percent above 270 degrees C?

Mr. Free: I think that calls for a speculative answer. It does not say what kerosene is in that book.

The Court: The objection is overruled.

A. I would not know, unless I tried them. They are two different types of tests.

Q. Does the book which you produced refer to only one test on kerosene, or are there other kerosenes mentioned in it? A. I find there is only one test on the method that compares with my A. S. T. M. method, which we could use with any fair comparison of the kerosene I used. Other kerosenes are listed.

Q. Are there boiling ranges given? A. I do not see any other distillation ranges given here.

Q. But it does refer to other kerosenes? A. It does refer to other kerosenes. It gives the Government specifications on kerosenes they have tested.

Q. What was the end point of the kerosene, your present kerosene that you have got? A. The kerosene I used?

Q. Yes. A. I used the standard method.

Q. No, but I say what was the end point? A. The end point I did not determine.

Q. What was the nearest you came to the temparature of (560) the end point, your 95 per cent point? A. That was 560.

Mr. Free: That is Fahrenheit?

The Witness: Fahrenheit.

Q. Do you agree with the witness Krawetz, who was called by the defendant and whose deposition has been read here, who indicates that there is a considerable variation in the boiling range of kerosene? I will read you his answer to the question:

> "Q. What is the ordinary boiling range of the ordinary kerosene? A. Oh, the boiling range of kerosene might start in at 380, 375, although they used to run it through, and get it at times at almost 600; but the good kerosene will run from 385 to 520."

A. You see, 375 or 370 or 380 or 385 is only 5 degrees. That is such a slight difference in a hundred degrees that I doubt from day to day you would hold your specifications any closer than that.

Q. But he also refers to the fact that they used to have kerosene run as high as 600 Fahrenheit. That is quite different from 520. A. He says they used to. Does he use end point or 95 c.c.?

Q. He says they used to run it through and get at times almost 600. A. At times 600, probably.

Q. That is, you do agree with him that they used to get a higher range point in the old days than they (561) do now? A. Not according to this book.

Q. That book mentions several kerosenes and gives the range of one of them, is that right? A. That is right.

Q. Looking again at this book you produced, on page 350, there is a reference to a table referring to some kerosenes and so-called water-white kerosene. Under "Distillation" it says "Distilled below 600 degrees F.", doesn't it? A. It does.

Q. Can you ascertain from the data given as to the other two kerosenes on that page whether they would be less volatile? A. In speaking of the Doughty patent, all through this we have talked about ordinary kerosene, water-white kerosene. You have here long-time burning oil and heavy seal oil. They are not ordinary kerosene.

Q. The ordinary kerosene he says at 600 degrees. A. The top point of 600, the end point.

Q. I call your attention to the fact that at the top of the table on this page the word kerosene is used in the heading, indicating three of the oils referred to, is that correct? A. As a distilled group. We used ordinary kerosene.

Q. Do you find a reference in the Doughty patent to the words "ordinary kerosene"? Does he say "ordinary (562) kerosene"? A. I find on page 2 he says "fractions of kerosene boiling above 250".

Q. Just a moment, does he say "ordinary kerosene" or does he say "kerosene"? A. "Kerosene."

Q. Does he use the expression "close cut" and "narrow cut" or anything of that sort? A. Yes, on page 1 he does. He limits you to the oils you may use. Solvents burning materially above 300 degrees Centigrade are unsuitable. He gives you a limit.

Q. But when he is talking about kerosene does he use the expressions of "close cut" or "narrow cut"? A. No, he does not.

Q. In the Lefferts patent, which refers to pyroxylin compounds, you said, I think quite correctly, that half-second cotton is a pyroxylin. A. Yes.

Q. But you did not mean to take back what you said yesterday, to the effect that that particular pyroxylin com-

pound did not exist until about 1910, did you? A. I cannot be positive just when half-second cotton came into commercial use.

Q. You know it was after 1888? A. I could not say to that. Pyroxylin was invented around 1850 to 1860. That is 28 years later. Just what steps had been made to make various viscosities I am not an authority to state.

(563) Q. Do you know what kind of pyroxylin was used to make celluloid in 1888? A. To make celluloid would be about, I imagine, a viscosity of anywhere from 10 to 20, or the like, four second cotton.

Q. That is quite different from your half-second cotton you used, isn't it? A. Cottons are alike in their solubility and all their properties, except the viscosity when made into a solution.

Q. Do they make a much thicker solution? A. A much thicker solution as a second, but the other properties are identical.

Q. You know as a fact that these low viscosity cottons are a fairly recent development, don't you? A. Oh, no, they are not a recent development, that is, you would not imply in the last ten years.

Q. I mean to say in the present century. A. I stated, I think, I am not able to tell when they were first put out.

Q. In Exhibit B-1 you have given a boiling range for terpineol from 210 degrees to about 217 degrees, haven't you? A. The terpineol I used to take my vapor pressures of, I have two readings on this chart, of the terpineol, and at the starting point of 5 c.c. it is approximately 210, and the 95 c.c. reading is 218.

Q. And the boiling point you got from the book was what? Was somewhere near the upper end, wasn't it? (564) A. 219.

Q. Part of the terpineol will fall off considerably below that, or at least as low as 212, according to your chart; isn't that right? A. That is correct.

Clinton Taylor, for Defendant—Re-direct.

Q. This bottle that your counsel has produced is the oil of cloves that you used to measure vapor pressure? A. Yes.

Q. That is, you mentioned the vapor pressure of this particular oil of cloves? A. Yes.

Q. The bottle contains the statement, "twice rectified", does it not? A. Yes.

The Court: What does that mean?

The Witness: It is pure U.S.P. oil of cloves.

The Court: What does "rectify" mean?

The Witness: That is a manner of cleaning it up and purifying the oil of cloves.

Mr. Byerly: That is all.

(565) *Re-direct examination by Mr. Free:*

Q. You will notice, Mr. Taylor, in referring to the Doughty patent, that you mentioned the upper limit of the solvent as preferred by Doughty, as being 300 degrees. That is in line 76 of page 1. When you cut off kerosene to make a petroleum fraction above 250°, as instructed in line 19 of page 2, how close a cut do you get? A. You will get a cut of about 40 or 45 degrees Centigrade.

Q. At least not more than 50? A. Not more than 50.

Q. Now I would like to make it clear that the temperatures given for boiling ranges are either the same or different from the temperatures given in the distillation ranges. Can you explain that? A. Well, if I understand you correctly, the standard method used by all petroleum companies is the A.S.T.M. method of distillation range. So long as all petroleum chemists use that method they are agreed that they will get the same results of different kerosenes in different parts of the country. The results will be comparable. When you try to compare a chart with an end point against a chart giving a distillation range, the two are not comparable.

Q. Where is the thermometer when you measure the distillation range and where is it when you measure the boiling

range? A. The thermometer, when you measure the distillation range by the A.S.T.M. method, is up in the (566) neck of the Engler flask, where the hot liquids go, pass over the bulb of the thermometer.

Q. And in the other method? A. The boiling range. I have never taken that. The A.S.T.M. is an accepted method.

Q. Now looking at the Doughty patent again, in line 18 of the first column on page 2, where he mentions fractions of kerosene, to you as one working in this art, would that mean ordinary kerosene or special kerosene? A. Well, that would mean ordinary kerosene, and I think you are limited by what he says on the previous page when he gives you a definite limit that the solvent should not boil above 300 degrees Centigrade to get a usable ink.

Mr. Free: That is all.

Re-cross examination by Mr. Byerly:

Q. Just one minor point on this Doughty patent. This expression you have referred to, in the second column on page 1 states:

> "Preferably the boiling point of the selected medium should be between 200 and 300 C., a boiling point lower than 250 C. being desirable."

So when he begins to talk on page 2 about kerosene, his remarks are directly the opposite, are they not? That is, in this case he wants something boiling over 250. Can you reconcile those? A. Only by experimentation; (567) in one case he is speaking specifically of kerosene, and that is all that I can see.

Mr. Byerly: That is all.

Mr. Free: That is all, Mr. Taylor.

Colloquy of Counsel.

Mr. Free: Now, your Honor, in view of the comment by counsel about the Hilton-Davis matter, that is, that there is nothing in the record which would help you to decide, I think it ought to be stricken, and I make a motion to that effect.

The Court: Is there any objection?

Mr. Byerly: I have no objection to striking—there were several matters. You mean the Hilton-Davis report?

Mr. Free: Yes. I think you ought to strike all of it.

Mr. Byerly: No.

The Court: Let us take up the report first. Do you consent to that?

Mr. Byerly: Merely because his Honor said the evidence may not be important, I do not know that that makes it incompetent.

Now what do you want to strike?

Mr. Free: Page 530, starting with the question about halfway down, to the first answer on page 532.

(568) The Court: Where is that?

Mr. Free: About the middle of page 530, and from there through the first answer at the top of page 532. That is all about the report.

The Court: Well, it was brought out there that his company did consulting work for the plaintiff in this case. That might be important.

Mr. Free: It does not lead anywhere. We seem to be agreed on that. I do not think it ought to be in the case.

The Court: Why should this go out?

Mr. Free: It is entirely immaterial and does not belong in the record, and is irrelevant because the net result of it all is that he did not know anything about the report.

The Court: What do you say to that?

Mr. Byerly: If your Honor please, there is a question beginning at the end of page 531:

Deposition of William A. Magie, for Defendant—Direct.

"Q. You remember that you were informed" and so forth, and the answer is: "I do not know that."

It is not clear to me whether that question goes in or out; but I do not think it is incompetent. He said he did not know.

Mr. Free: Well, if there is any pertinence at all to this report, we have a right to see it. If we can-
(569) not see it we do not know what is in it, and certainly there should not be anything in the record about it.

The Court: There is no interpretation on it, so I will deny the motion.

Mr. Free: Now, your Honor, I would like to offer in evidence the Magie and Krawetz depositions.

Deposition read in evidence of William A. Magie produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Please state your name. A. William A. Magie.

Q2. You are connected with the Magie Brothers Petroleum Products Company at 1640 Carroll Avenue? A. That is right.

The Court: Whereabouts is that?

Mr. Free: That is in Chicago. (Continuing.)

Q3. What is the business of that company? A. We are in the petroleum lubricating oil and solvent business; everything except gasoline and fuel oil, I guess that is the way you would describe it.

Q4. And you have among your customers of the Chicago office the Sinclair & Carroll Company? (570) A. That is right.

Q5. I show you four invoices, dated January 2, 1941, January 29, 1941, January 30, 1941, and February 15, 1941, from Magie Brothers Petroleum Products to Sinclair & Carroll Company, Inc., and ask you whether you recognize them (handing documents to the witness)? A. I recognize them, yes.

Q6. These are invoices regularly issued by your company to your customers for purchases of products from you? A. Yes. These are the duplicates there; but apparently the original goes down to New York, I guess; that is right.

Q7. The 502-C oil mentioned on one of these invoices is one of your products? A. That is right.

Mr. Free: I offer in evidence as Defendant's Exhibits K-1, K-2, K-3 and K-4, the invoices identified by the witness, and I offer them in order of chronology.

(Marked Defendant's Exhibits K-1, K-2, K-3 and K-4 respectively.)

By Mr. Free:

Q8. In connection with such products as this 502-C oil, did you ever have occasion to ascertain the physical constants, such as vapor pressure, boiling range, and so forth? A. Well, that is an unusual request. I will say this, we do get distillation ranges primarily, and we (571) have in the past worked up vapor pressure points; we have done that.

Q9. How do you go about getting that information? A. Well, that is an information we cannot do with our own oil. I mean, that is work we do not do on our own oil. That has been turned over to Mr. Krawetz here, who worked that out.

Q10. Mr. Krawetz is with the Phoenix Chemical Laboratory of 3953 Shakespeare Avenue, Chicago? A. That is correct.

Q11. I show you a report marked, "Laboratory No. 144,560", dated July 1, 1941; to Magie Bros. Oil Co.; by

Phoenix Chemical Laboratory, Inc., and ask you if you recognize that (handing document to the witness)? A. I do.

Q12. Was that received by you on or about the date that it bears? A. I believe that is correct.

Q13. And it has been in your possession ever since until you handed it to me a few minutes ago? A. That is right.

Mr. Free: I offer in evidence as Defendant's Exhibit LL, the laboratory report produced by the witness.

The Court: This exhibit here does not say what it was that he examined—the vapor pressure based on the distillation range of what?

(572) Mr. Free: That will come out later, your Honor. The sample 2 is identified as 502-C oil.

The Court: Well, there is nothing on here.

Mr. Free: The witness brings that out later.

(Marked Defendant's Exhibit LL.)

By Mr. Free:

Q14. Referring to this report, what do the two samples marked No. 1 and No. 2 refer to? A. The No. 1 sample refers to our 470 oil, and the No. 2 to our 502-C oil.

Q15. And you identified the samples of those two oils in the way they are shown on this report? A. Yes.

Q16. When you sent them to Mr. Krawetz? A. That is right; and I identify them here by their boiling range, too.

Q17. Do you recall a telephone call from Mr. Roy Carroll, of Sinclair & Carroll, within the last ten days, asking you for the vapor pressure and boiling ranges of the 502-C oil? A. I do.

Q18. And you gave him the data that he requested by telephone in reply? A. That is right.

Q19. Where did you obtain that data? A. Well, I obtained that data by going back through the file to this report here.

Q20. You are now referring to this report of July 1, (573) 1941, Defendant's Exhibit LL? A. That is right.

Cross examination by Mr. Byerly:

Q21. I will ask you a couple of questions until we get the book. Mr. Magie, how long has your firm been selling this oil which you call 502-C? A. Since about the middle of 1938.

Q22. In February, 1939, did you put out a circular giving the boiling range of this oil, 502-C? A. In February, 1939, I think we may have done that, yes, sir.

Q23. Is the boiling range given under Sample H of Exhibit LL the same as that which you put out in your circular of this oil? A. Well, now, you have got me there. I assume that it is; but I just cannot say that offhand. Yes, I would say it should be.

Q24. The boiling range would not be different in 1939 from that in 1941? A. There should not be much difference there, no.

Q25. How do you control the boiling range of these (574) fractions? A. Well, they are controlled in a tower; I mean, when we cut these fractions, they are cut in a regular fractionating tower, and they are balanced, and when we get the material coming that we want, that particular fraction that we want coming off, we have to test that for distillation before we can consider that as the product, and then it has to be tested every fifteen minutes in order to control that particular stream.

Does that answer your question?

Q26. Yes. These vapor pressure figures are something that you do not determine in your laboratory? A. No, sir, we do not.

Q27. And when you sent this to the Phoenix Chemical Laboratory, Inc., did you tell them your boiling point range figures for this sample? A. We told them our boiling range, and I think that they have had samples for distilla-

tion; but I think in this case the boiling range was given to them and calculated from that.

Q28. Is this Sample II a solvent? 502-C, would you call a narrow cut? A. Yes; yes.

Q29. How long have you been in the business of selling oils for use as solvents? A. Since the middle to the end of 1938.

Q30. Did you sell any oil before 1938? A. A solvent?

Q31. Yes. A. No solvent. We have been in business for fifty-three years.

Q32. I see. A. Fifty-four years.

Q33. Did you make this narrow cut before 1938? A. No, sir.

Q34. Did you find there was a demand for narrow cut oils as solvents in 1938? A. No; no, we did not.

Q35. Why did you start to sell them then if there was no demand? A. You mean— We started to sell them in 1938, the middle or the end of 1938, because we had requests for oils of that type.

Q36. And, if I understand you correctly, this was the first time you had requests for oils of that kind? A. That is correct.

Q37. Did these requests indicate the purpose for which these oils were to be used? A. Yes; yes, they did. They were to be used in this quick-dry type of printing.

Q38. You have sold narrow cut solvents to the International Printing Ink Company, or Interchemical Company, have you not? A. Yes.

Mr. Byerly: That is all.

Re-direct examination by Mr. Free:

Q39. Is there any substantial difference between the 502-C oil which you sold to Messrs. Sinclair & Carroll in February, 1941, and that which you sent to the Phoenix (575) Laboratory for testing? A. You mean—will you read that? A. No.

Q40. You try to cut the 502-C oil as accurately as you can in your various runs in the still? A. Oh, yes.

Q41. And that conforms to a specification which is relatively rigid? A. Yes, it is.

Q42. You were asked by Mr. Byerly whether you sold solvent oils to the I.P.I. Do you know whether you sold them to the I.P.I. before you sold them to Sinclair & Carroll, or after? A. You have got me there. I don't know. I can get that record.

Q43. It is not important. I thought you might remember. A. Wait a minute. I think that in the (576) Spring of—or the Winter of that year, that we had a request for oil from I.P.I. I don't want to put this in without knowing it definitely; but that was my recollection.

Q44. That was the Winter of 1941? A. No. We are going back to 1938 now. That other is the Winter of 1941.

Q45. Now you said two years; I did not know which year you meant. A. I meant back in 1938.

Q46. You have long been selling kerosene and torch oil and illuminating oils, have you not? A. We have been selling kerosene as an accommodation, you might say, for a good many years; yes, we have been.

Q47. And this 502-C oil is a cut from the kerosene series, is it not? A. It is between kerosene and fuel oil distillate. I had better say that.

Mr. Free: Now the deposition of Mr. Krawetz.

Deposition read in evidence of John Krawetz produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Please state your name. A. John Krawetz.

Q2. You are connected with the Phoenix Chemical Laboratory, Inc., of 3953 Shakespeare Avenue, in Chicago, are you not? A. Yes, sir.

Q3. What is your capacity? A. I am the President of the Company.

Q4. Will you give me a brief outline of your education and training along the lines of chemicals and fuels? A. I was graduated with a Bachelor of Science Degree from Northwestern University in 1923, and was awarded my Master of Science Degree in 1934, at which time I decided to devote myself exclusively to the study of petroleum and petroleum products, and in that manner I started to work as an engineer and investigator, and finally developed my own laboratory, and have been operating the Phoenix Chemical Laboratory ever since, and we are devoted exclusively to the study of petroleum products.

Q5. I show you Defendant's Exhibit LL, and ask you (577) whether you recognize it (handing document to the witness)? A. I do.

Q6. Whose signature is that at the bottom of that document? A. This is my signature.

Q7. As for the data on that report, do you recognize that? A. I do.

Q8. Tell us what you understand to be the meaning of the two notations, "Sample I" and "Sample II" on Exhibit LL. A. Sample I and Sample II were subjected in the first instance to a so-called A.S.T.M. distillation.

Having obtained an A.S.T.M. distillation curve, we took the 50 per cent boiling point as the basis of calculating the vapor pressure of the material at various temperatures.

Q9. Now will you describe briefly what you mean by A.S.T.M. tests that you mentioned? A. The American Society for Testing of Materials has established procedures for examining various types of products, amongst them petroleum products.

Inasmuch as petroleum products are, in the main, mixtures of hydrocarbons rather than single chemical identities, it is necessary to very definitely establish the test procedure because unless you definitely establish the test procedure

insofar as, let us say, the distillation is concerned, you may obtain all kinds of results.

In other words, if you distill a mixture of materials by various methods, you will get various distillation ranges, which is not true in the case where you are dealing with a chemical identity, just one chemical compound.

Therefore, the American Society for Testing Materials has definitely prescribed the flask in which a distillation is carried out. That is, the dimensions of the flask; the position of the side arm on the neck; the diameter of the neck of the flask. They have definitely described the position of the thermometer. They prescribed the rate at which heat is applied to induce distillation. They prescribed the cooling bath.

So everything that is variable, that is, in test procedure, is established because, we have no control over the mixture of the material; that is, we can control the distillation range of the material, but we cannot control the concentration of the individual molecules of hydrocarbon present in the mixture.

So we have to definitely control the test procedure, so that laboratories in different parts of the country and different parts of the world can obtain similar reproducible results.

Q10. With that A.S.T.M. method you obtained the boiling points of both Samples I and II shown on Defendant's Exhibit LL? A. That is right.

Q11. Now, having obtained those, I understood you to say a while ago you likewise obtained the vapor pressure— A. That is right.

Q12. —as indicated on Defendant's Exhibit LL? (578) A. That is right.

Q13. Now, how did you go about doing that? A. To determine the vapor pressure, there are two ways of doing it. One is to determine experimentally each vapor pressure at their temperature. But that is long-winded and is not usable for control purposes.

So there have been developed charts by the petroleum industry. Those charts have proven to be very satisfactory and do not deviate to any degree from the experimental data.

The chart which I have there (indicating) is one published in "Petroleum Refinery Engineering" by Nelson, "First Edition," "1936," "McGraw-Hill Book Company, Inc." on page 127.

The data obtained has proven to be accurate and is easily obtained. You have a curve, showing the boiling point of the material at 760.

Q14. Please identify the curves; the lefthand curve, the middle curve— A. The middle curve.

Q15. —and the right curve. A. That is the middle curve. Now, is this the right (indicating)?

Q16. Yes. A. The righthand curve shows the temperature range at which the vapor pressure might be desired. Then laying a straight-edge across the two curves, one point on the temperature at which the vapor pressure is desired, and the other point on the boiling point of the material, the vapor pressure will then be shown at the intersection of the straight-edge, and the curve on the lefthand side (579) of the book, showing vapor pressure in millimeters mercury absolute.

Q17. Now, that is the way you obtained the vapor pressures, in millimeters— A. Yes, sir.

Q18. —given on Defendant's Exhibit LL? A. That is right.

Mr. Free: I offer in evidence as Defendant's Exhibit M-1, the flyleaf, pages 124, 125, 126, 127 and 128 of Nelson's book entitled "Petroleum Refinery Engineering, First Edition", published in 1936, McGraw-Hill Publishing Company, New York.

(Marked Defendant's Exhibit M-1.)

Q19. Approximately how many times have you had occasion to use this method of ascertaining vapor pressures of petroleum liquids from the boiling points thereof? A. Well, it is quite frequently. I don't know just how many times; but on the average, requests for information of this type come in to us about ten times a month.

Q20. And you have done that for some years? A. Yes.

(580) Q21. About how many? A. Oh——

Q22. One, two, ten? A. Oh, I have done this—of course, this data was later than 1936. It has been proven correct in 1928. I have been doing that for about ten or twelve years.

Q23. These samples that were received by you from Magie, on which reports, Defendant's Exhibit LL, were made, were marked "Sample I" and "Sample II", as they came to you? A. Yes, that is right.

Q24. And you reported them accordingly? A. As "I" and "II".

Cross examination by Mr. Byerly:

Q25. Mr. Magie said that he gave you his boiling range data on these samples when he gave you the samples. A. I don't think so. I think we determined the boiling point range data ourselves because if—there are different instances where Mr. Magie called us up and told us the boiling point range; then we never rendered any report because we did not send him any bill.

Now, in this case there is a complete report; there was a bill and our records indicate that the distillation was run, so I think that Mr. Magie was thinking of other instances where he just called us up.

Q26. You would not send him a bill for just deter-
(581) mining the vapor pressure from the chart, when you were furnished with the boiling range? A. No, not to a regular customer.

Q27. How much did you charge him for this report? A. I really don't know. I would think the complete reports amount to something like ten or twelve dollars for the two. I would not remember exactly.

Q28. Did you specialize in chemistry in college? A. Yes.

Q29. Since you have been out of college, you have worked only with petroleum? A. Only with petroleum. But I have a layman's knowledge of other products. But I have devoted myself exclusively to petroleum.

Q30. Now, looking at the last line of your report, which was where you drew the line on the chart to get the figure 18 millimeters— A. Let's see. I have not a good straight-edge here. This is about 150 Fahrenheit. We will put it down, 302.

Now, 522 F. is the average boiling point; so it shows a vapor pressure of 18 mm.

Q31. Now, this simple method uses only the 50 per cent boiling point, don't it? A. It takes the average boiling point, otherwise we would have to take each fraction by itself. If you want to get it, you will take a true boiling point curve and then take each fraction (582) by itself, and then of course it gets to be so complicated, and any additional information is merely figures. It has no real value.

Q32. Is it your understanding that all petroleum fractions which have the same 50 per cent boiling point are identical? A. Now, no, because "identical" deals with a lot of other things. There are many things that may have the same boiling point and there are many things that may have the same vapor pressure, and yet they are absolutely different materials. They stand in no relationship to each other; just as you may have a colored man and a white man and a Chinese, each of them five feet six inches tall.

Q33. But getting down a little more to the boiling range; here you have given the boiling point on five, the boiling point for this material. A. That is right.

Q34. Now, can you conceive of a fraction of petroleum in which the 50 per cent boiling point would be identical

with that which you have here, but the other four boiling points were different? A. That is quite possible. But then your fifth would be—it would be a case in which 50 per cent boiling point does not represent the average. But that 50 per cent boiling point gives you practically the average.

Q35. But if that was not so, how would you use the table? A. If it were a case where you had something (583) that starts boiling at 80, in other words, the boiling point would run up to 700, I would not use that table at all; the table would not fit into a picture like that. The table only fits into a picture where your boiling points will be approximately your true boiling point; but it is true for a continuous distillation.

Q36. Now, only in the case when that 50 per cent boiling point represents the average point? A. Yes, readily approximates the average, then you see it is to be used. Otherwise, you can use the average boiling point, if you want to, because after all Raoult's Law of vapor pressure of your material represents the qualitative and quantitative quantities of the constituents.

So the average boiling point would give you a vapor pressure.

Q37. Looking at your first curve in the book, that is, the lefthand one, on page 127, is that a logarithmic scale? A. That is a logarithmic scale.

Q38. But it has no zero on it, has it? A. No. It approaches zero; that is the closest it comes.

Q39. Then this zero figure given in your report for 114 degrees C. is not accurate, is it? A. No; it is marked "approximately".

Q40. Are any of these figures closer than one milli-(584) meter in accuracy? A. Well, I would not say that they are. You see, being mixtures of this kind, it is hard to say whether it is within one millimeter, or whether it is within two millimeters. It is close as necessary for the operation of a refinery.

Re-direct examination by Mr. Free:

Q41. Suppose you wanted to find out what the vapor pressure of this 502-C oil is approximately, at a low temperature range. A. Yes.

Q42. How would you go about doing that? A. Well, what we would do probably, try to—of course, if it gets down to a low temperature, the ordinary instruments may not be there to—there would not be any indication; there would be a trace of vapor pressure; there is bound to be a trace of vapor pressure, such as even a piece of iron has a vapor pressure.

But I would say that, in my opinion, in the laboratory I would not have any instrument that would be sufficiently accurate to permit me to determine the vapor pressure at a low temperature.

Q43. So you would estimate it by extrapolation or some other method? A. I certainly would.

(584-A) Q44. These hydrocarbons, such as 502-C oil, are in what hydrocarbon series, approximately? A. Well, this material would be a very narrow cut; it might be the very end of the kerosene range, and it might be just a little from the low end of the distillate.

But, in general, this is specially prepared material, because your kerosene and distillate overlap, and you would find that your distillate—within your distillate oil, your fuel-oil, would have a lower initial boiling point than this. This is a specially provided fraction.

Q45. That would be in the pentadecane up to the octadecane series? A. Yes, because there are so many branches which increase the boiling points, and so forth. So, at the end, the tail-end of kerosene, you might term it.

By Mr. Free: That is all.

Re-cross examination by Mr. Byerly:

Q46. You say this is a narrow cut. What is this boiling range of 502-C? A. The boiling range is from 505 to 549 Fahrenheit. It is a 50-degree cut.

Q47. It is really less than 50 degrees; about 4—. A. 44.

Q48. 44 degrees Fahrenheit? A. Yes, 44 degrees Fahrenheit. But that is a mighty close cut. You can call it 44 if you want to; but in refining operations, two or three degrees either way means very little, because you are dealing with mixtures and you have big equipment. Your equipment is accurate but not precisioning equipment.

Q49. What is the ordinary boiling range of the ordinary kerosene? A. Oh, the boiling point of kerosene might start in at 380, 375, although they used to run it through, get it at times at almost 600; but the good kerosene will run from 385 to 520.

By Mr. Free: Fahrenheit?

By the Witness: Fahrenheit.

By Mr. Byerly:

Q50. That is, the boiling range, 140 degrees Fahrenheit, is that right? A. Yes; that is right.

Q51. How about fuel oil, what is the boiling range of that? A. Well, that depends whether that is a No. 1, 2 or 3 distillate, and if you term that the fuel oil, you may say it is around 380 and runs up to the very heavy stuff that will crack before it will distil.

Q52. What is vapor pressure? A. Vapor pressure of a material is the pressure developed by the substance against the atmosphere. You see you have several materials, like hydrocarbon mixture, millions of little molecules. Some of them have energy driving them out; others are coming in. Now, the force generated by those trying to get out against those that are falling back, and the resistance they exert against the atmosphere is your vapor pressure.

Q53. If the liquid is actually boiling, what is it? A. 760, under ordinary atmosphere. Now, like today, if your barometer is 750, then the boiling liquid is 750. Then again, if you put pressure on it, then that is different. But under ordinary atmosphere, generally speaking, it is 760.

By Mr. Byerly: That is all.

By Mr. Free: That is all.

Now I would like permission so that this Exhibit LL is a little clearer, to mark the Sample II in the border with the legend "502-C oil".

Any objection to that, Mr. Byerly?

Mr. Byerly: No, I am agreeable to that. (Mr. Free marks the exhibit.)

(585) Mr. Free: Now, your Honor, we have another deposition, that green binder, and that is on prior use, testimony taken out in Cleveland.

The Court: This is on prior use?

Mr. Free: Yes, your Honor.

The Court: Do you want to read all of this?

Mr. Free: Most of it, yes. It will probably take the rest of the day. Now the testimony of Edward Beres:

Deposition read in evidence of EDWARD BERES produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Will you please state your name, age and residence? A. My name is Edward Beres; my age is 33 years; my residence is 13010 Soika Avenue, Cleveland, Ohio.

Q2. Mr. Beres, where are you now employed? A. The Cleveland Tractor Company.

Q3. And what are your duties there? A. Gisholt operator. That is a machine like a lathe for making certain parts for tractors.

Q4. Prior to your present employment, Mr. Beres, by whom were you employed? A. The Tower Press.

Q5. And when did you leave the Tower Press? A. The 23rd of last month.

Q6. What was your employment prior to the time that you were with the Tower Press? A. Evangelical.

Q7. By "Evangelical" do you mean Evangelical (586) Press? A. Evangelical Press.

Q8. Company? A. Publishing House.

Q9. Was there any connection in any way between Evangelical and Tower? A. The same man managed the Evangelical Publishing House who is now President of Tower Press.

Q10. Is it not a fact that the Tower Press is, in a sense, successor to Evangelical Press? A. Yes.

Q11. Tower Press is now located in the same place where Evangelical was located? A. Yes.

Q12. Where is that? A. 1900 Superior Avenue.

Q13. Do you remember when you first came to Evangelical Press? A. It was May 19, 1925.

Q14. Do you know a Mr. Joseph F. Jirousek? A. Yes.

Q15. Who was he? A. He was my foreman.

Q16. He was your foreman? A. Yes.

Q17. Where, if you please? A. Tower Press.

Q18. At the Tower Press? A. Yes.

Q19. Was he at any time with Evangelical Press? A. Wait a minute. At that time they hadn't changed management yet. It was Evangelical Press then. Evangelical still owned it when he was there.

Q20. Well, as I understand your answer then— A. He was with Evangelical.

(587) Q21. —he was with the Evangelical Press at that time? A. Yes.

Q22. What was his job there? A. Foreman; supervisor of the press room.

Q23. What was your job at Evangelical then? A. Press room. Kelly operator.

Q24. What do you mean by "Kelly operator"? A. I was working on a Kelly press.

Q25. Is that the name of a kind of press? A. Yes.

Q26. What kind of press was it? A. It is a flat bed cylinder press; small press.

Q27. Is it the kind of press where the paper goes around a cylinder or through the press flat? A. It goes around the cylinder.

Q28. Have you any idea when Mr. Jirousek came with Evangelical Press? A. I think it was about 1929 or 1930; somewhere around there.

Q29. Is there any way in which you can arrive at that date from some experience of your own? A. I got married while he was there, September 3, 1931.

Q30. You got married while he was foreman? A. Yes.

Q31. What sort of printing did you do at Evangelical, Mr. Beres? A. All sorts of weeklies and monthlies, letterheads, envelopes, all kinds.

Q32. By "weeklies" and "monthlies" I take it that you (588) mean publications? A. Yes.

Q33. Did Mr. Jirousek at any time bring you a special ink and ask you to use it?

Mr. Watson: I object to that as leading.

The Court: The objection is overruled.

A. Yes, sir.

Q34. Can you relate the circumstances connected with that? A. Well, I remember the first day that he started to work on it when I had to go out and get some chemicals for him that he used in mixing the ink.

Q35. By working on it what do you mean? A. Well, that is when he was preparing the ink and later on I used

the ink. I had to use the ink on a weekly that had to be out as soon as possible. In other words, the job came in late and it had to be printed and folded, and put out quickly.

Q36. You spoke of Mr. Jirousek sending you somewhere for chemicals. Can you tell us more about that? A. Do you mean where he sent me?

Q37. Yes. A. Sherwin Williams Company, down in the flats.

Q38. Do you remember any of the circumstances of his sending you? A. I will never forget the time when he brought me an envelope and said to me, "You are fired." He said, "There is your pay."

(589). Then he said, "Now, I am just kidding you. Go down to the Sherwin Williams Company and get this stuff for me." I remember that distinctly.

Q39. Do you remember what he sent you for? A. No; I don't. It was in the envelope and I never looked.

Q40. By the statement that it was in the envelope do you mean that what he sent you for was in the envelope or that the instructions were in the envelope? A. The instructions, what I was supposed to get.

Q41. What did you get, if you know, or if you remember? A. It was something in a can, I believe.

Q42. Do you remember anything about what it was like? A. No; it was wrapped up.

Q43. Do you remember any characteristic of it that impressed you at the time? A. Yes; it smelled something like almond extract.

Q44. Do you mean by "it" the material in the can? A. Yes.

By Mr. Watson:

Q45. What did you say? A. It smelled something like almond extract.

By Mr. Free:

Q46. Did you bring that material back to Mr. Jirousek? A. Yes; and I gave it to him.

Q47. Now, you spoke of Mr. Jirousek having an ink. (590) Can you tell us something about that ink and what he did with it, and what it was for? A. Well, the purpose was quick drying, to use on jobs where you would be able to print it and take it in to the bindery right away, and fold it without smearing.

Q48. Is that what the ink was for? A. That was the principal thing.

Q49. Now, did he ask you to use that ink or something of that sort? A. Yes; I was to use it on that job that came in every week, came in at the last minute and had to be in the mail at a certain time.

Q50. Do you remember what job that was? A. It was that Jewish Temple Globe, four-page folder, from Ansel Road or on 105th.

Q51. That was a weekly publication, I think you said? A. Yes.

Q52. Do you remember the name of it? A. The Temple.

Q53. The Temple? A. Yes.

Q54. Did you print this folder with the ink that Mr. Jirousek gave you? A. Yes, sir.

Q55. Can you tell us something about how you used that ink and what sort of results it gave, and so on? A. Well, it was a four-page folder; you were to run one side through and turn it, and run it through again. We were able to do it with this ink without waiting for (591) any time to dry and take it to the bindery to be folded right away.

Q56. Well, now, in order to get this straight in our minds, you spoke of a four-page folder, I believe? A. Yes.

Q57. Just how was that printed? That is to say, how would it be laid on the sheet? A. Well, it would be laid out just like an ordinary sheet and you would run it through once, turn it over and run it through again, so that I could

cut the sheet in half and you would have two copies of it. There would be a front and a back.

Q58. When you speak of sending it through do you mean sending it through a press? A. Yes; the second time to back it up.

Q59. If I understand correctly what you have just said, the four pages would be printed on one side of a sheet of paper? A. That is right.

Q60. And then that same sheet of paper would be reversed or turned over? A. Turned over, yes.

Q61. And sent through the press again? A. That is right.

Q62. To have the same thing printed on the other side? A. Yes.

Q63. Whereupon the sheet would be cut apart into— A. Copies.

Q64. Two copies? A. Yes.

(592) Q65. And then those copies, what was done with them? A. They were folded in the bindery.

Q66. And how did you fold them? A. Well, just made one fold like a book.

Q67. Well, did you do it by hand or by what means? A. By machine.

Q68. You would do it by machine? A. Yes.

Q69. What were the characteristics of this ink that Mr. Jirousek gave you? How did it work? A. It worked fine, as far as drying is concerned, the texture of the ink, there was nothing that I was able to kick about, it felt smooth, laid nice, and then didn't smear on the half tone. That is the main thing in printing; that is, if the half tones dry quickly the type print is bound to be dry quickly.

Q70. Were there half tones in this Temple publication? A. Well, on the first page of it there was a picture of the Temple.

Q71. And you say that the ink did dry rapidly? A. Yes, sir.

Q72. What did that enable you to do? A. To have the work out quicker. We didn't have to wait or let a job like that lay probably anywhere from half an hour to possibly an hour before you would be able to back them up.

Q73. If I understand your answer correctly, when you (593) refer to a wait you mean the wait between the time when you ran the sheet through the press the first time and then ran it the second time? A. That is right; yes, sir.

Q74. Well, what about that wait? How much wait did you have when you were using Mr. Jirousek's ink? A. Just from the time I took it from the front of the press and put it back in the feeder. It wasn't long. I would say it wasn't as long a wait as that. It was just actually putting the stock back in the press, in the back.

Q75. In other words, there was no wait at all, as I understand your answer? A. No wait.

Q76. How many colors were printed on this publication called the Temple? A. This was just black.

Q77. Just black? A. Just black.

Q78. How many copies were run, if you remember? A. It was around 1,700. That would mean 850 sheets because it was run through the press twice. That would give you 1,700. That is where you get your work and turn.

Q79. If I understand your answer correctly, you say that in printing this publication you would run 800 sheets through your press? A. Yes.

Q80. And then immediately, without waiting, run them through again? A. Yes.

Q81. Having reversed the sheets? A. That is right; yes.

(594) Q82. How did the ink act on the press? A. It didn't dry. It stuck right to the rolls. That is what I mean. You know, it didn't dry, but it had just enough texture there to make it smooth. It never dried, even in the can. No consequence of any kind, you know.

Q83. Now, I don't believe that you have fixed the date of your use of this ink on the publication The Temple. Let

me ask you first: Did you use it only once or did you use it a number of times? A. We used it a number of times.

Q84. On that same publication? A. Yes.

Q85. Did you use it on other printing jobs also? A. There was another one that I used it on that was not a rush just like that one was. It was called the Cleveland Engineering Society.

Q86. Getting back to the question of fixing that date, turn your attention, please, Mr. Beres, to the first use of this ink that was given you by Mr. Jirousek, which you can recall, and tell us, as closely as you can, when that was; that is, the first time you used it? A. That was a little after I was married. That is the way I recall it because, as I told you, I told my wife of it. You see, he told me that I was fired. You know, coming at a time like that, I wouldn't be apt to forget it. That was the beginning of his making the ink, I believe, and it was just a short time after that that he gave me the ink to try out.

(595) Q87. Well, about when was it? A. That was within the year, I would say, or possibly within six months from the time that I was over to this place for that chemical, whatever it was, and I remember that it was cold at the time that I went down in the Flats for him, but whether it was in the spring of the year or the fall of the year I couldn't say. That isn't distinct in my mind.

Q88. Did you at that time print a publication called Metal Progress? A. We have printed it at that place, yes, for a long time.

Q89. I mean you, yourself? A. No.

Q90. You didn't work on that job? A. No; my press was too small.

Q91. I would like to have you state for the record, because I don't believe you have, except to say that you ran the press, what your type of work would be called. A. Pressman.

Q92. You are a pressman? A. Yes, sir.

Q93. Or you were a pressman at that time? A. Yes, sir.

Q94. Now, beyond what you have told us, did you know anything about what this ink was or what was in it? A. No.

Q94. Do you know whether or not Mr. Jirousek prepared it? A. Well, I don't know if he prepared it; that (596) is, I never saw him do it, but he brought the ink over to me, and I brought the chemical to him, and all I know is just that there was a sort of almond smell to it.

Q95. Well, now, as to the almond smell, was that characteristic of the ink itself? A. Yes, sir.

Q96. It smelled that way also, did it? A. The ink smelled that way; yes, sir. That is the only way I would be able to check it, that it was different from other inks. I believe that if I had to test it, I would be able to pick it out.

Cross-examination by Mr. Watson:

Q97. When were you married? A. 1931.

Q98. What date? A. September 3.

Q99. What kind of paper was The Temple printed on? A. It was an enameled stock; that would be called dull coated enameled stock.

Q100. Do you know from whom the paper was purchased? A. I couldn't tell you that. We used to get quite a bit of paper from this Petrequin Paper Company on Superior Avenue.

Q101. What is the name of that concern? A. I think it is the Petrequin Paper Company on Superior Avenue.

Q102. Do you know whether or not this paper was what is known as a clay finish? A. Not that I know of.

Q103. It was a dull enameled stock, as far as you know? (597) A. It was dull enameled stock.

Q104. Just what sort of press were you using? A. Kelly-press.

Q105. Describe it, will you please? A. It is just a small highspeed press made by the type founder here and it is

automatic. It took a sheet 17 by 22. That was the largest size. The smallest was 7½ by 11. Of course, it is a high-speed press.

Q106. It was a flat bed press, was it? A. Yes, sir.

Q107. And a sheet fed? A. Yes, sir.

Q108. How long did it take you to print 850 sheets? A. About twenty minutes.

Q109. What was in the receiving end of the press? A. What was in the receiving end?

Q110. What happened to the sheets after they went through the press? A. They went through a gas.

Q111. The sheets went through a gas? A. Yes.

Q112. That was the usual gas flame that they have on that sort of press? A. Yes. We didn't have the spray gun at that time.

Q113. And then where did they go after they passed this gas jet? A. They fed into a jogger box that kept them straight.

Q114. And they piled up sort of loosely in this box? A. No; we had a jogger going. That was the purpose of it, (598) as well as piling them, because he told me to open them up more so that they would scatter more and go together then.

Q115. I don't understand just what you mean by that. A. Well, it was a box affair, you know, and when a sheet comes down it falls open up. When the sheet falls it goes like this. It comes together. It keeps the sheets straight. So that if the sheet was varying either way, which is from one side to the other, it would always put the sheets together so that they would be straight.

Q116. Did the sheets fall printed side down or printed side up? A. Printed side up.

Q117. How did you get those sheets back into the press to print the other side? A. Pull them out and take them in the back, and just turn them over.

Q118. Turn the pile right over? A. Not all at once because you couldn't do it, because you would have them

scattered all over, but just turn them over and put them right back.

Q119. Did this press have any rated, specially rated, speed? In other words, how fast was it supposed to print? A. It all depends upon what kind of work you are running. At that time I was running around 2,500 an hour.

Q120. Could you print 2,500 an hour? A. Yes. You know that was one-color work.

(599) Q121. How long did you stay with the Evangelical Press? A. I just left there about—I don't remember. I believe it was in January. It was around January that they changed hands about eight years ago.

Q122. About eight years ago they changed the name, at any rate? A. Yes.

Q123. You stayed right on through with— A. Yes, sir. I was there seventeen and a half years with Mr. Theuer.

Q124. How long was Jirousek there? A. I believe it was about four or five years. I am not quite sure. I believe it was around four or five years that he was there.

Q125. Do you remember of him being discharged? A. I don't know if he was discharged, or not.

Q126. You know that he left before you did? A. Oh, yes; he left before I did. I don't know what the reason was.

Q127. What sort of can did you bring this stuff in for Mr. Jirousek? A. Do you mean how big it was? Do you mean what it was made of?

Q128. What sort of can was it? Can you describe it to us? A. No, sir.

Q129. Did it leak? A. No, sir.

Q130. How were you able to smell what was in it if it didn't leak? A. It had an odor to it. They might have (600) gotten something on the paper when they were wrapping it.

Q131. Did you smell any of this almond ink after Mr. Jirousek had left the plant? A. No, sir.

Re-direct examination by Mr. Free:

Q132. You spoke of gas in this connection and I believe you stated that you were using at the end of the Kelly press a gas flame? A. Yes.

Q133. That, as I understand it, is a gas flame over which the sheets pass? A. That is right.

Q134. Does it extend the full width of the sheets? A. Yes, sir.

Q135. Does it apply heat to them? A. Yes, sir.

Q136. You were using gas, were you not, with Mr. Jirousek's ink? A. I believe we were.

Q137. You spoke of a spray or, rather, you spoke, as I recall it, of not having sprays at that time. What do you mean by "sprays"? A. The chemical that goes in between the sheets, that is sandwiched in between, and keeps them from offsetting. We didn't have it at that time.

Q138. That, however, is something that is used today, is it not? A. Yes, sir; it is in liquid form and when it comes out it is real fine dust.

Q139. That operates to space the sheets apart? A. Yes, sir; it keeps them from offsetting.

(60) Q140. You spoke of a jogger in connection with this press. As I understand it, that is on the delivery end of the press? A. Yes, sir.

Q141. Does the action of that jogger tend to slide the sheets over each other? A. Yes, sir.

Q142. Does it do so immediately after the sheets are printed? A. Yes, sir.

Q143. When you were using Mr. Jirousek's ink did you have any trouble with the jogger or any effects produced by it? A. No, sir.

Q144. In connection with inks other than the Jirousek ink, Mr. Beres, did you ever have any difficulty in connection with the jogger? A. Yes.

Q145. What was that difficulty? A. It would not set as quick and dry as quick as with Mr. Jirousek's ink.

Q146. And when "it", as you say, did not dry as quick and you had some trouble with it, what kind of trouble was that? That is to say, what happened? A. It would offset. Then we would have to wait longer for it to dry.

Re-cross examination by Mr. Watson:

Q147. Was the printing press that you used just the same regardless of the kind of ink that you used on it, or did you make any changes in the press? A. Well, the difference would be that on bigger presses there are bigger plates.

(602) Q148. I am referring to this press that you were running at that time. Did you change it in any way when Mr. Jirousek gave you some ink? A. No, sir.

Q149. Just the same as it was with regular ink? A. There is nothing to change on it.

Mr. Free: Now the deposition of Charles J. Theuer:

Deposition read in evidence of CHARLES J. THEUER produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Will you please state your name, age and residence? A. Charles J. Theuer; fifty years old; 19618 Edgecliff Boulevard, Euclid, Ohio.

Q2. And your present occupation, Mr. Theuer? A. President of Tower Press.

Q3. How long have you been with the Tower Press? A. We organized in 1935.

Q4. And prior to that time where were you? A. With the Evangelical Press.

Q5. Was there any connection between the Evangelical Press and the Tower Press? A. Yes; the Tower Press is a sort of continuation of the Evangelical Press. In 1935 the Evangelical Press went to Harrisburg, Pennsylvania, and we took over the equipment, and organized the Tower Press.

Q6. Is the Tower Press located in the same place that the Evangelical Press was? A. Yes, sir; 1900 Superior Avenue.

(603) Q7. How long were you with the Evangelical Press or from what date to what date? A. Well, I was with it for 22 years.

Q8. That is, prior to the time that you went with the Tower Press? A. That is right.

Q9. Did you know a Mr. Joseph F. Jirousek? A. Yes, sir.

Q10. Will you tell us who he was or is? A. He was the foreman of our press room.

Q11. And by "our" are you referring to the Tower or the Evangelical? A. Evangelical Press.

Q12. Do you know when he came with the Evangelical Press? A. We don't have the records of the Evangelical Press and it is only by certain jobs that went through at a certain time that I remember just the years that he was with us.

Q13. May I ask you whether or not you made a search for the employment records of the Evangelical Press? A. Well, at the time that we took over the Evangelical Press those employment records were taken down to Harrisburg.

Q14. They are not available here? A. They are not available here; no.

Q15. You spoke of fixing the date of Mr. Jirousek's employment by the Evangelical Press. Can you do so, (604) according to your recollection? A. Well, I would say

that he was with us in 1930 and 1931. As I recall it, he was with us just for a period of about two years.

Q16. What was his position at that time? A. He was the foreman of our press room; superintendent of the press room.

Q17. What sort of work was the Evangelical Press doing at that time? A. Publication printing, commercial printing.

Q18. Did the Evangelical Press publish a magazine called Metal Progress? A. Yes, sir.

Q19. Does the Tower Press still publish it? A. Yes, sir.

Q20. Do you know whether or not it has ever been published by anyone else? A. I know definitely that it has not been published by anyone else.

Q21. In other words, then Evangelical and Tower together have done the entire printing of Metal Progress throughout its life as a magazine? A. Yes, sir.

Q22. When was it begun, if you recall? A. The first issue was August, 1930. I think that we printed it in August.

Q23. You printed the first issue in August, when? A. 1930. It was termed the September issue.

Q24. I notice that you are referring to a paper there, Mr. Theuer. What is that? A. This is a job record of the (605) Evangelical Press, card index of all jobs and order numbers listed, and so on, and so forth.

Q25. Where did you get that record that you have with you? A. I got this out of our files.

Q26. By "our files" do you mean the files of the Tower Press? A. Yes.

Q27. Did Tower Press take over those files of the Evangelical Press? A. Yes; it was just a matter that we asked for them so that we could refer back to the card for details and the like.

Q28. When was it that you received those records? You say that you asked for them. When was that? A. Well, they were never out of our possession. We just kept them there.

Q29. In other words, you asked for them at the time that Tower Press was organized and took over the business of Evangelical Press; is that correct? A. Yes, sir.

Q30. Now, this record that you have, Mr. Theuer, what does it show? A. That shows that in August, 1930, we billed the first printing of Metal Progress.

Mr. Free: I offer in evidence the card produced by the witness and showing the first printing of the September 1930 "Metal Progress," as Defendant's Exhibit N-1.

(Marked Defendant's Exhibit N-1.)

(606) Mr. Free: That is the front and the back of the card.

Q31. This publication, Metal Progress, how often is it issued? A. Monthly.

Q32. And has that been true throughout the life of this publication, the printing of which began in August, 1930, according to your testimony? A. Yes, sir.

Q33. Can you tell us anything about the manner in which this publication is sent out, particularly as to the dates of issue and that sort of thing? A. Well, the closing date is changed so often that it is difficult to tell, but we do attempt to get it in the hands of the subscribers around the 15th of the month.

Q34. By that do you mean the month which it is dated? A. Yes, sir.

Q35. You say that it is irregular. Do they approximate that in some way; that is to say, getting it into the hands of the people who read it, around the 15th of each month? A. Yes.

Q36. Has that been true right along? A. Yes, sir.

Q37. Is the entire magazine printed by your company or, rather, I should say, was the entire magazine printed by Evangelical Press or were parts of it printed elsewhere? A. It was all printed by us.

Q38. That then includes the cover? A. That is right.

(607) Q39. Do you recall anything in connection with any issues of Metal Progress involving difficulties in the printing of covers? A. Just what do you mean?

Q40. Well, for example, difficulties with ink in the printing of covers? A. Well, you always have a certain amount of grief, as it were, with the printing of magazines like that, on coated stock, and especially at that time.

Q41. By "at that time" what do you mean, Mr. Theuer? A. Well, at that time they didn't have what we have now, what is called an offset spray to eliminate offset, and that is a chemical that is sprayed over the sheet to prevent offset.

Q42. And by "at that time" do you mean at or about the time that this magazine was started? A. Yes.

Q43. Can you tell me approximately when the sprays, that you have just mentioned, did come into use by you? I am trying generally to fix the time about which you were talking in your last answer. A. Well, we didn't have that equipment with the Evangelical Press. We bought it when we took the thing over as the Tower Press; that is, we bought our offset equipment probably in 1936 or something like that.

Q44. So that I take it from your answer that you did have offsetting troubles at times with the covers of (608) Metal Progress? A. That is right.

Q45. Did Mr. Jirousek have anything to do with that situation? A. Well, it was up to him to print the covers and whether he did it himself, or not, which he didn't, of course, it was up to him to superintend the printing of the covers, as well as the inside and all the way through.

Q46. It was up to him to see that the printing was done without offset trouble, I take it from your answer? A. That is right.

Q47. I hand you a publication marked September, 1931, and ask you if you recognize that? A. I do.

Mr. Free: I would like to mark that for identification as O-1.

(Marked Defendant's Exhibit O-1 for identification.)

By Mr. Free:

Q48. What is it, please? A. Well, it is a September, 1931, issue of Metal Progress which we printed.

Q49. Do you recall anything in connection with the printing of that particular issue, and especially the cover of it? A. This job was going through every month, of course, and it is pretty hard to remember the details; in fact, I didn't attempt to do so. However, this particular issue has aluminum printing on it. Whether that was the first issue, I don't remember.

(609) Q50. Does that recall anything to you? A. Well, aluminum printing is more difficult to print than regular ink.

Q51. Well, then, I take it that your answer is that you don't recall anything special in connection with the September, 1931, issue of Metal Progress, excepting that it was printed with aluminum ink and aluminum ink did present some problems? A. That is right.

Q52. You spoke of offset difficulties in printing covers for Metal Progress and that it was Mr. Jirousek's job to correct those difficulties. Do you know of anything in particular that he did in that connection? A. Well, I know that we eliminated offset as much as possible and the proof that we continued the printing of the magazine would indicate that we satsified the customer on that score.

Q53. Do you know of anything that Mr. Jirousek did in that connection to eliminate offset?

Mr. Watson: I object to that as leading as the witness has already answered the question to the best of his recollection.

The Court: The objection is overruled.

By Mr. Free: (Continuing.)

Q54. Go ahead, Mr. Theuer. If you can do so, answer the question. A. Well, I know that Mr. Jirousek was (610) always doctoring up ink and doing his best to lick this problem of offset.

Q55. Did you ever see him doctoring up ink? A. Oh, I might have seen him at times at the mixing table and whatnot.

Q56. Did you see any ink used that he had doctored? A. Naturally, I saw it on the press while it was running if I went out there to see it running.

Q57. In the course of your duties then you do observe the running of the presses frequently and keep an eye on that sort of thing? A. Yes, sir.

Q58. So that in observing the runs of these inks what did you find? How did they run? What did they do? A. Well, they printed the job as we have it here.

Q59. Well, you have spoken of offsetting troubles. What was there about them in connection with Mr. Jirousek's ink?

Mr. Watson: I make the same objection, as the witness has already answered the question.

The Court: The objection is overruled.

By Mr. Free: (Continuing.)

A. Well, as I say, the job was satisfactory to the customer and we ran it with the least amount of offset possible. In some instances we eliminated the offset entirely.

(611) Q60. Will you tell us something about the printing of the cover for Metal Progress? How is that done? A. It is printed one color at a time. The front and back are printed at the same time in what we call a work and turn form. The inside pages of the cover are locked up over here and then the sheet is reversed, and the inside

printing here is backed up with the cover then the next time that it goes through the press.

Q61. Are the sheets then subsequently cut apart? A. That is right.

Q62. Considering the cover of September, 1931, issue of Metal Progress, which you have before you, how many colors do you find there? A. Three colors including the aluminum.

Q63. Besides the aluminum the other colors are what? A. Orange and black.

Q64. Are you able to tell from examining that cover the order in which the colors were printed? A. This looks as if the aluminum was printed first on this and the black is printed over it.

Q65. Can you state that from your examination of that cover? A. Yes; I would say so because I see some of the aluminum showing through here on some of the black printing.

Q66. Does the printing of black on aluminum in a (612) printing job of that kind, or not, involve offset difficulties? A. Yes, sir; it does.

Q67. Could you tell by an examination of that magazine whether or not the offset difficulties had been overcome? A. Yes; I would say they had.

Q68. Referring again, Mr. Theuer, to these inks of Mr. Jirousek, what drying characteristics did they have? Were they slow or fast? A. I know that Mr. Jirousek was experimenting and working with a fast drying ink. That was his purpose, I think, in all of his experimentation.

Q69. That was what he was working on, you said. Did he produce a fast drying ink? A. To the best of my knowledge, he did; yes.

Q70. Did you see it in operation? A. I saw it on several jobs that we had.

Q71. Can you state something about how it was used and what its drying characteristics were, as you observed

them? A. Well, I know that it dried so quick that sometimes it would dry on the rollers and then on the press plate.

Q72. How about on the sheet? A. Well, it dried quicker than ordinary ink would.

Q73. How is a sheet handled in a press? Is anything done to dry it? A. Yes; it goes over a flame. It goes over a gas flame.

(613) Q74. And that applies heat to it, does it not? A. That is right.

Q75. Now, you spoke of the rapidity of drying of these inks. What did that mean in terms of printing operation? What was it good for? A. Well, you could put the sheets through the press that much faster and eliminate offset.

Q76. Are you referring now to a single printing operation or a plurality of printing operations? A. Well, one would involve the other. Let me say it this way: If the first color goes through the press and dries quickly, you can put the second color on that much quicker.

Q77. Are you referring now to the same sheet of paper or different sheets, or both sides of a sheet of paper, or both? A. Oh, both. You can turn your sheet if your ink is dry, of course.

Q78. That is, in making a work and turn job, such as you have referred to? A. Yes, sir.

Q79. If the sheet is not dry, what happens when you work and turn? A. Well, you just can't print it. That is when you run into a smudging and smearing, and that sort of thing.

Q80. Well, for the sake of the record, does that smudging and smearing all occur on the press or is it (614) between the sheets of paper, or both, or what? A. Between the sheets of paper.

Q81. After they have passed through the press? A. After they have passed through the press.

Q82. Does the smearing also occur on a press in a work and turn operation? A. Yes. The opposite side, if your

sheet is not dry, would put an impression on what we call the cylinder tympan or the tympan.

Q83. Can you tell us, for the record, what that is? What is the tympan on a press? A. The tympan is really the last sheet that goes on the cylinder after the so-called make ready sheets have been put on the cylinder.

Q84. And that sheet stays on the cylinder, does it not, through the printing operation? A. Yes.

Q85. Now, you spoke of smudging trouble and I take it that your answer means that if you have offsetting trouble you smudge on the tympan? A. Yes.

Q86. Is that correct? A. Yes.

Q87. Does that, or not, interfere with the printing operations? A. Definitely so.

Q88. You spoke of observing the use of inks prepared by Mr. Jirousek and indicated that they dried rapidly. Did they dry rapidly enough, or not, to eliminate smudging as between the sheets? A. Yes; I would say that they did.

Q89. Did they dry rapidly enough, or not, to prevent (615) smudging of the tympan? A. It eliminated it to a great extent.

Q90. Did you ever see a work and turn operation performed with Mr. Jirousek's ink? A. I suppose I should say that this particular cover was a work and turn proposition.

Q91. Well, would you know whether or not that cover was made with Mr. Jirousek's ink? A. I wouldn't know definitely; no.

Q92. Then, as to the date when you did see the use of Mr. Jirousek's inks, can you give us anything as to that? A. Well, it was in the course of his demonstration and I would say it was in 1931. I really don't know when he did start doing the experimenting. I can't say that definitely.

Q93. Do you recall any particular jobs on which, according to your recollection, Mr. Jirousek's ink was used? A. I can't recall any particular jobs. I know that he was work-

ing primarily on this Metal Progress proposition because it was the only monthly publication that we had at that time and it gave him the best chance to experiment.

Cross examination by Mr. Watson:

Q94. Did the Evangelical Press purchase the paper on which this magazine Metal Progress was printed? (616) A. No; the publisher alway furnished that paper.

Q95. Who was the publisher? A. American Society for Metals.

Q96. The publisher had the paper shipped into your printing plant, did it? A. Yes, sir.

Q97. Do you know from what paper company it came? A. Well; it was bought through the Milleraft Paper Company and they deal with the Champion Paper Company, and I just assume that it came from them.

Q98. You think that it came from the Champion Paper Company? A. Yes.

Q99. Where did you get this number which is marked September, 1931; that is, this number that was referred to in your deposition? A. Well, I didn't get it.

Q100. You didn't see this particular copy until you came here today? A. That is right.

Q101. Is it your understanding that this is the first number that you published, this September, 1931, number of Metal Progress? A. No, sir. The issue of September, 1930, was the first.

Q102. You haven't that one here, have you? A. No.

Q103. Do you remember when Mr. Jirousek left the Evangelical Press? A. The best I can recall is that it was in 1932 some time.

Q104. Do you remember why he left? A. No; he left (617) of his own accord. He was doing some patent work or something like that. I don't know what it was. He was working on this ink proposition.

Q105. I understand that you personally didn't pay any very great amount of attention to his experimental work in your plant? A. That is right.

Q106. You were printing mostly with ordinary linseed oil inks, I suppose? A. We were buying the inks mainly at that time from Charles Enen Johnson & Company and whatever their inks consisted of we were printing with those.

Q107. Did you have any sheet fed presses? A. All of our presses are sheet fed.

Q108. You didn't have any web presses? A. No, sir.

Q109. What type of press was this magazine Metal Progress printed on? A. That was printed on what we call a Miehle automatic, 25 by 38.

Q110. Is that a flat bed press? A. Flat bed press, yes. I would like to qualify that. We had a large Kelly at that time. Whichever press was available at the time would be used for printing it. It was either on the Miehle or the large Kelly.

Q111. They were both flat bed presses? A. That is right.

Q112. They print only one side at a time? A. That is (618) right.

Q113. And then some time in 1935 you got this spray to prevent offset? A. It was soon after we took over the Tower Press, either 1935 or 1936.

Q114. Was that fully effective in eliminating offset? A. Yes.

Q115. In your ordinary work with these Miehle presses, how soon did you back up? A. Are you speaking with the spray now?

Q116. Yes. A. Well, we can back up, say 2,000 impressions, up to 2,000 impressions, and then put the first sheet through again.

Q117. How long is the interval between the first and the two thousandth? A. About two hours. Of course, you understand that it depends upon the nature of the job. A

good deal depends upon what kind of paper it is printed on. Ink, of course, will dry on some papers quicker than others. It is often a question of whether it is dry, or not.

Q118. Well, you back up quicker since you have that spray than you did before, I suppose? A. That is right.

Q119. Have you ever, in connection with your two presses, made your own inks or have you always bought them? A. We have always bought them.

Q120. Then it wasn't part of Mr. Jirousek's job to (619) make ink, as I understand it? A. No, sir.

Q121. Did you use any of the inks that he doctored up after he left? A. That I don't know. I couldn't say.

Re-direct examination by Mr. Free:

Q122. How soon could you back up after using Mr. Jirousek's ink? Do you recall? A. I don't recall.

Q123. Would you say that you could back up as quickly as you could with the spray? A. Personally, I wouldn't take the chance on any ink that I would with a spray job.

Re-cross examination by Mr. Watson:

Q124. Do you know whether or not this magazine, the September, 1931, issue of Metal Progress, is printed on clay coated paper? A. Are you speaking of the inside now, or the cover?

Q125. I will ask you about both. Do you recognize the paper? A. Yes; it is what we call a coated sheet. Later developments have made a sort of what they call a process coated which I understand is done right on the machine in the original making of the paper, but that hadn't been developed at that time. Yes; I would say that that is a clay coated sheet.

(Recess to 2:00 p. m.)

(620) AFTERNOON SESSION.

Mr. Free: I am continuing to read from page 44 of the depositions, this being the deposition of Charles J. Theuer:

Q126. Mr. Theuer, I see that you have another card with you. Will you state what that is? A. This is a record of printing that we did for the Charles Eneu Johnson Company in 1932.

Q127. What did you print for that company at that time? A. Just some miscellaneous jobs. There happens to be six jobs listed on this card.

Q128. Were all of those jobs for Charles Eneu Johnson Company? A. That is right.

Q128. Where did this card come from, Mr. Theuer? A. It came from the files of the Evangelical Press which we have.

Q129. The same files that you mentioned before in your testimony? A. That is right.

Q130. I see on that card a notation "Believe it or not folder." Do you know what that was? A. It was a folder describing a special ink known as a non-scratch ink, or something of that sort; quick drying ink.

Q131. Can you be more specific than that? What special ink was it? A. The ink that Mr. Jirousek had perfected.

(621) Q132. That was a folder, was it not, printed for Charles Eneu Johnson & Company? A. That is right.

I will offer in evidence that folder as Defendant's Exhibit P-1.

Mr. Watson: I object to it as immaterial and I move to strike out the testimony of the witness as to the circular as being secondary. The circular should be produced if it is in existence—and irrelevant.

The Court: This is a separate exhibit from the circular?

Mr. Free: Yes, your Honor: That just shows the time when that circular was printed. The circular is coming in now.

The Court: All right. You will produce the other?

Mr. Free: Yes.

The Court: Objection overruled.

(Marked Defendant's Exhibit P-1.)

By Mr. Free:

Q133. Do you know anything about that circular, Mr. Theuer? A. Well, it was recalled to my mind and I saw it yesterday.

Q134. Do you have a copy of it? A. No; I don't have a copy of it.

Q135. Do you remember what it was about other than (622) in general, as you have testified, it was about the Jirousek ink?

Mr. Watson: I object to that as secondary.

The Witness: I don't recall the wording on it.

Mr. Watson: That is objected to, your Honor.

The Court: There isn't any way of proving anything about this ink.

Mr. Free: No, the circular is coming in. As a matter of fact he is leading up to it in that way.

The Court: Overruled.

By Mr. Watson:

Q136. By the way, what was your job with the Evangelical Press around the '30s? A. I was manager.

By Mr. Free:

Q137. Mr. Theuer, I hand you a printed paper and ask you if you can recognize that. A. Yes; I recognize this.

Q138. What is it, please? A. It is a six-page folder entitled "Believe it or not."

Q139. Is that, or not, the "Believe it or not" folder that you referred to in your former testimony in connection with Defendant's Exhibit P-1? A. This is the folder.

Q140. Your testimony then is that that is the folder (623) referred to in this exhibit? A. That is right.

Mr. Free: I offer in evidence as Defendant's Exhibit Q-1, the folder just identified by the witness.

Mr. Watson: This exhibit is objected to as a self-serving declaration and as completely irrelevant. I think perhaps your Honor might examine the exhibit on that.

Mr. Free: The folder speaks for itself (handing to the Court).

The Court: What do you offer it for, to prove what, something about this ink?

Mr. Free: Yes. That describes the ink which was sold, and it is a sample of the ink which is here mentioned.

The Court: Back in 1932?

Mr. Free: Yes, in the Spring of 1932.

Mr. Watson: On the contrary, it has a lot of self-serving declarations about what a wonderful thing has been produced. It has nothing to do with the composition of the ink at all. I think it is entirely inadmissible.

Mr. Free: It isn't self-serving because the defendant did not make it. It was Charles Eneu Johnson who put out that circular.

The Court: Then call that company. This is (624) nothing but an advertisement.

Mr. Free: Yes. We have someone called later.

The Court: I will reject it for the present. Objection sustained.

Mr. Free: Would you mark that for identification Q-1, please.

(Marked Defendant's Exhibit Q-1 for idenfification.)

Mr. Byerly: I think, your Honor, the preceding exhibit was admitted subject to this one, and should now be stricken out. That is the record of printing this advertisement.

The Court: It will be stricken so far as it refers to this advertisement—so far as this circular, rather, Defendant's Exhibit Q-1. For the other purpose it is being admitted, if there is any other probative purpose for it.

Mr. Free: It is referred to by Mr. Theuer of his printing of this circular.

The Court: He may use it to refresh his memory, as an exhibit.

Mr. Free: Yes.

The Court: I think I will reject it. Strike it out.

Mr. Watson: If your Honor please, Questions 141 through 150 on cross examination relate to the rejected (625) exhibit, so I shall not offer those so long as the exhibit is not in evidence.

The Court: Very well.

Mr. Watson: I shall turn to Question 151 on page 49:

Mr. Free: I think I will put these questions and answers in, your Honor——

Mr. Watson: I believe, your Honor—excuse me.

Mr. Free: Under Rule 43(c), Offer of Proof.

Mr. Watson: If you will remember, your Honor, I attempted to do the same thing in connection with that little formula card, which you rejected as evidence, and I attempted to identify it further through questions asked by Mr. Free, and you said if he did not want it in I could not put it in. Now these questions which Mr. Free is attempting to put in are on the same category, that is, questions that I asked and which did not go in, and he is attempting to put that in.

The Court: He can put them in as an offer of proof.

Mr. Free: That is all I am doing, under Rule 43(c).

The Court: It isn't necessary to read them. Give them to the stenographer.

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(626) **The offer of proof under Rule 43(c) is as follows:**

Q141. Did you write this circular? A. No, sir.

Q142. It simply came to you as it is, a job to be printed and you printed it? A. That is right.

Q143. It is printed on clay coated paper, too, isn't it? A. Yes, sir; or coated paper.

Q144. There is nothing whatever on the circular to identify it as having been printed on your press, is there? A. To indicate that we printed it, do you mean?

Q145. Yes. A. No; only— It is definitely our type and our general makeup, and I would say as to the type used that this inside is what we call the No. 3 Caslon type, which we have, and this heading here is Metropolis bold type which we were using exclusively at that time; that is, I mean that that is the only way that I can tell that, because we had that particular type at that time.

Q146. You weren't the only print shop in the country that had that type at that time? A. No, I wouldn't say that, but here it is the same. This heading here is the same type as was used in the heads here in Metal Progress. We bought that type specially for Metal Progress at the time and have kept it primarily for their use the same as this here.

Q147. Have you any recollection of——

(627) Q148. Is that correct? A. That is right.

Q149. You say you saw this circular, Defendant's Exhibit Theuer F, a few days ago? A. Yes.

Q150. Have you any recollection of actually seeing it before that? A. Oh, yes; I remember of printing that.

Deposition of Charles J. Theuer, for Defendant—Re-cross—Re-direct.

Re-cross examination by Mr. Watson:

Q151. According to your card, Defendant's Exhibit Theuer C, your order for September Metal Progress was a little over 8,000 copies, was it not? A. That is right.

Q152. How long did it take from the time that this number of Metal Progress went to press to the time when it was ready for delivery? A. Well, it is pretty hard to say because we print it in forms. Oftentimes we have the first 32 pages ready and we will print those and get those out of the way. I would say that after the closing or after all the type is set up and forms are locked up, from a week to ten days.

Q153. To get out an edition of 8,000? A. Yes, sir. I would just like to qualify that. I was thinking more of our edition now which is a whole lot larger than it was at that time, and also the book is also increased in size. It wouldn't take that long to get out 8,000 (628) copies.

Q154. You mean that it wouldn't take that long now to get out 8,000 copies, but how long did it take in 1930? Do you remember? A. Well, about a week.

Re-direct examination by Mr. Free:

Q155. You spoke of finishing the first 32 pages, I believe, in one of your answers on cross examination. The interior portion of the magazine was printed, I gather from that, in sections? A. That is right.

Q156. How was that done? A. It was printed sixteen pages at a time.

Q157. Sixteen pages on one side of the sheet? A. That is right.

Q158. Was the sheet thereafter turned over for more printing? A. Yes, sir.

Q159. Would they be the same sixteen pages or another sixteen pages? A. They made a work and turn form. They took the first sixteen and then the back sixteen.

Q160. In any event, the sheet was turned and printed both sides, as I gather from your testimony? A. Yes, sir.

Q161. In making those runs, what was your usual procedure? You would run the sheets, I take it, through the press once to print the sixteen pages on one side and did you then immediately reverse the stack and run (629) the sheets through the press again, or was there an interval? A. Well, an 8,000 work and turn sheet would mean only 4,000 impressions and ordinarily we would let that dry a few hours after getting 4,000 done to make sure that it was completely dry.

Q162. One other question, Mr. Theuer. At the time that the printing of Metal Progress was started, as you have testified, in August, I believe, of 1930, was, or was not, Mr. Jirousek at that time with the Evangelical Press, if you recall? A. I don't recall.

Now the deposition of Lewis E. Nichols.

Deposition read in evidence of Lewis E. Nichols produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Please state your name, age and address? A. My name is Lewis, L-e-w-i-s E. Nichols; 46 years old; and the address is 17416 Oxford Avenue, Cleveland, Ohio.

Q2. Where are you employed at the present time, Mr. Nichols? A. Charles Eneu Johnson & Company, Cleveland.

Q3. What do they do? A. We sell printing inks.

Q4. Are those inks manufactured in Cleveland or elsewhere? A. The base colors are manufactured at Philadelphia and we have what we term a rehandling plant here in Cleveland.

Q5. What do you mean by "base colors"? A. What we term a base color is a combination of dry color and varnish, full strength dry color and varnish

(630) Q6. What is the nature of your duties with the Johnson Company? A. Do you mean now?

Q7. Yes. A. I am superintendent of manufacturing.

Q8. How long have you been with the Johnson Company? A. Since 1914, but I was out two years for the war.

Q9. Do you know Joseph F. Jirousek? A. Yes.

Q10. Did the Johnson Company ever manufacture inks in accordance with the instructions received from Mr. Jirousek? A. Yes.

Q11. Who did that? A. I did.

Q12. Can you give me any idea of the date when you began to do that? A. Well, approximately the end of 1931 or the beginning of 1932.

Q13. In making these inks what did you do? A. I worked under him.

Q14. By "him" you mean whom? A. I worked with Mr. Jirousek on this thing.

Q15. Yes? A. In other words, he had, as I would put it, the original idea and I worked with him on it.

Q16. Can you tell us more specifically just what sort of thing you did at that time in connection with the Jirousek's inks, that we are talking about? A. Well, Mr. Jirousek had this idea and he discussed it with me, the possibilities of making a quick setting ink, and through him—let me put it this way: His idea was to incorporate certain (631) varnishes with regular printing ink to accomplish his purpose.

Q17. Yes. Now, did you make some inks in accordance with his instructions? A. I did.

Q18. Can you tell us how you did it? That is, what did you use and where did you get it? A. Well, this was done by the use of certain base colors that we had, with the addition of the vehicles, as they are called, that Mr. Jirousek had.

Q19. Do I understand from your answer that the Johnson Company used its own ink base or, rather, that you used the Johnson Company's ink base? A. That is right.

Q20. The pigment and the varnish? A. That is right.

Q21. And that you added to that, in accordance with the instructions of Mr. Jirousek, some materials which he furnished? A. That is right.

Q22. Did you have a formula for doing that? A. I just don't know how to answer that. We did arrive at a certain definite formula, but it was as a result of a certain amount of experimental work before we arrived at this certain formula.

Q23. Did you have something written down somewhere which would tell you how much of the various ingredients to put in there? A. Yes, sir.

(632) Q24. What was that? How did you keep it? A. We kept it in our records at the office.

Q25. Have you consulted your records to see if you could find any such formulas for the inks that we are speaking of? A. Yes.

Q26. Did you find any? A. We did.

I will skip Questions Nos. 27 and 28.

Q29. You have now handed me some papers. Will you tell me just what these are and where you got them? A. They are formula sheets from our permanent records of formulas.

Q30. Have they been kept in your permanent records? A. That is right.

Q31. Who removed them from your permanent records? A. I did.

Q32. When, please? A. This morning.

Q33. Did they come out of a large book? A. They came out of a large loose leaf binder.

Q34. You spoke of these things, I think, as formula sheets? A. That is correct.

Q35. Can you point out on the paper, which I now hand you, any formula for a Jirousek ink? A. This one on this sheet and the three on the other sheet.

The witness then pointed to formula No. S 58929, and formula No. S 58850, and I will introduce in evidence (633) this sheet as Defendant's Exhibit R-1.

Mr. Watson: If your Honor please, I object to the exhibit on the ground that it shows symbols which are not self-explanatory and therefore do not indicate the composition of the ink.

The Court: I have not seen the exhibit.

(Same handed to the Court by Mr. Free.)

The Court: Well, if that is explained, it can go in; otherwise not.

Mr. Free: Yes. He does physically produce the parts of his file.

Mr. Watson: Am I to understand then, it is to be marked for identification at this time?

The Court: Mark it for identification only.

(Marked Defendant's Exhibit R-1 for identification.)

By Mr. Free:

Q36. Referring to the formula, which you have identified by the number given above, I notice the words "Perspective H T black" appear hereon. What does that mean? A. That means this particular type of quick drying ink or this particular type of quick setting ink.

Q37. And what particular type of quick drying or setting ink do you mean? A. I just don't understand.

Q38. In other words, do you mean the Jirousek ink about which you are speaking? A. Yes.

(634) Q39. Referring to the items in this formula, the first item, under the column headed "Pounds", reads 33, and under the word "Color" appears "Black", and then

under the word "Number" is "506" and then there is a batch No. 6634. Can you tell me what that material was?

Mr. Watson: I object to that. It is a matter of record. I think that we should have the records. I would like to ask the witness first whether his company has records explaining these various numbers and symbols. Has it?

The Witness: It has; yes, sir.

Mr. Watson: In that case I object to any oral testimony.

The Court: I think I will sustain the objection unless he accounts for the absence as being lost, and therefore gives secondary evidence.

Mr. Free: He explains where they are, your Honor.

Q40. Can you get those records? Do you have them here in Cleveland? A. We don't have them here. They are all formulas.

Q41. Where are they located? A. They are located in Philadelphia.

Q42. Do you have knowledge of what these materials (635) are? Let me put it this way: Do you know of your own knowledge what the material is about which I have just asked you? A. I do not have a definite knowledge of the formulas of those base colors.

Mr. Watson: Your Honor, it seems to me the objection is good. This being secondary, it applies to all this testimony. He was asked to produce all the records and he failed to do so.

Mr. Free: He is asking about each item.

The Court: He is not testifying as to his own knowledge.

Mr. Free: But he knew something. For example, he knows some of them but not all of them.

Colloquy of Counsel.

Mr. Watson: I have not said anything previously, your Honor, because this demonstrates the extent of his ignorance. I think his testimony is really entirely immaterial. I think it should be all stricken out.

The Court: I think so, too. Strike it out. From where on?

Mr. Watson: It starts with Question 43 where he says: "I do not have a definite knowledge of the formulas of those base colors."

The Court: 43?

Mr. Watson: Yes, your Honor, on page 59.

The Court: 43 to where?

(636) Mr. Watson: I have not come to the end yet, your Honor (examining record).

All of the testimony from Question 43 through Question 127, on page 71, relates to the formulas produced by the witness and to his operations in accordance with such formulas. I believe that is all immaterial.

The Court: All right.

Mr. Free: On page 64, your Honor, he says even though he may not have known what the parts were, he put them together and made inks out of them, and they sold——

The Court: He has already testified he made that ink.

Mr. Watson: Yes, sir.

Mr. Free: He says he saw it used on page 65.

The Court: He has already testified to that.

Mr. Free: Not this witness.

Mr. Watson: Not this witness, no, sir.

The Court: Somebody else. What question is that?

Mr. Free: Page 64—well, your Honor, to make it continuous, I will go down to Question 85 on page 64:

Q85. Did you see any of the inks so manufactured and sold shipped out by the Johnson Company of Cleveland? A. Yes.

The Court: Well then that is all right.

(637) Question 85 on page 64 is admitted.

Mr. Free:

Q86. What was the purpose of this ink?

The Court: Strike that out.

Mr. Free: And question 88:

Q88. Mr. Nichols, in connection with your manufacture of this ink did you in any way use it and test it? A. I did not use it personally, but I have seen it used. I have also tested it.

I think that is proper. The witness physically tested it.

The Court: But he said he did not use it personally. So how could he have tested it if he did not use it.

Mr. Free: He said he saw it used. He said, "I have also tested it." That is in answer to question 88.

The Court: No, I will strike that out, too.

Mr. Free: Question 89, he said he saw it used in the plant of the Evangelical Press at that time.

The Court: That tends to corroborate other testimony. I will admit Question 89 and the answer thereto.

Mr. Free: And Question 90:

Q90. Were any tests made at all in the plant of the Johnson Company? A. We made what I would call crude tests with a proof press and a small electric furnace (638) supplying the heat or, I should say, a small electric hot plate.

The Court: That goes out.

Mr. Free: Question 91:

Q91. In the course of running those tests did you print sheets with this ink? A. Yes.

The Court: That goes out.

Mr. Free: 92:

Q92. Was it your practice to do so in connection with the various batches of ink that were made up? A. Yes.

The Court: That goes out.

Mr. Free: Question 93:

Q93. That is, of this kind? A. Yes, sir.

The Court: Do you object to that?

Mr. Watson: I think all of this testimony is objectionable, your Honor, unless we have definite proof as to what the ink was. I mean here is testimony that something was used and we do not know what was used. It is all immaterial.

The Court: It is immaterial.

Mr. Watson: As the record stands.

Mr. Free: He is talking about a certain ink and he is telling us what he has seen.

The Court: But he is not able to identify the ink.

(639) Mr. Watson: No, sir.

Mr. Free: He described it as some ink he mixed up from materials which were furnished to him.

The Court: That does not make any difference.

Mr. Free: I would like to offer the questions that have been excluded under Rule 43(c).

The Court: Very well. Make a note that they are excluded by the Court and offered in conformity with that rule.

Offer of Proof.

Evidence to which objection was sustained by the Court but offered under Rule 43(c), is as follows:

Q43. What were those base colors? How would you know what to use? A. I don't quite get you on that, if I may put it that way.

Q44. I will rephrase the question. If I asked you for 33 pounds of black No. 506, batch No. 6634, would you know what to give me? A. Yes.

Q45. What would it be? A. It would be a litho base black.

Q46. Manufactured by whom? A. Charles Eneu Johnson & Company of Philadelphia.

Q47. Is that, or not, a standard material produced by that company? A. As far as I know, it is.

Q48. Well, your recollection, I think, extends to (640) 1914. What can you say as to whether or not that is a standard material and has been from 1914 on? A. Well, I would say that is has, to my knowledge, been used as a base material since that time.

Q49. Now, by "base material" you mean what, Mr. Nichols? A. Well, this is getting complicated.

Q50. I mean in general. A. Well, we, as the Cleveland branch of Charles Eneu Johnson & Company, do not manufacture from raw materials. We work from base inks. These bases that we use in the formulas of our inks are all made up by our Philadelphia plant and they are supplied to us by our Philadelphia plant.

Q51. I take it that your testimony is that the particular black, about which I have been inquiring, is a base ink made by the Philadelphia factory of your company? A. That is correct.

Q52. And is supplied to you as such? A. That is right.

Q53. How about the next item, "Blue, C 3841, D 2432"? A. That would fall in the same category.

Q54. Would the next item, the purple, fall in the same category? A. Yes, sir.

Q55. What is the fourth item, b-r-o-n-z-i-n-e, bronzine? A. That is another base material.

Q56. Are all these base materials manufactured by (641) your company? A. I am not sure about the bronzine. The others are.

Q57. The bronzine might come from elsewhere? A. That might come from some place else.

Q58. The next item on that formula is "aluminum hydrate dry." Do you know what that is? A. I do not know the chemical formula of aluminum hydrate dry.

Q59. Do you know whether or not it is a material employed in inks? A. Yes, sir.

Q60. The next item is listed as "compound No. 600." State what that is, if you know. A. I do not know.

Q61. I call your attention to the next item, listed as "Cobalt drier," and ask you what that is. A. That is purchased by us regularly from the Harshaw Chemical Company.

Q62. Is it a material with which you work all the time? A. That is a material which we use in the formulation of inks.

Q63. Is the next item marked "Kerosene" ordinary kerosene? A. That is ordinary kerosene purchased from the Standard Oil Company.

Q64. The next item is marked "C. C. S." What is that? A. That I don't know.

Q65. Where did you get it? A. That was supplied by (642) Mr. Jirousek.

Q66. That was a material supplied by him? A. Yes, sir.

Q67. What about the next item noted here as "Blac"? A. That should be b-a-l-e. That is a typographical error. That is a material that was secured from Mr. Jirousek.

Q68. Did he furnish both of those materials to you? A. That is right.

Q69. What about the last item on the list, "Vioflor"? A. That is a reodorizing agent which gives it a different smell. I don't remember where that came from.

Q70. Now, did I understand you to say that as to the two items marked "C. C. S." and "Blac" which you say should be Balc, those were materials furnished by Mr. Jirousek and you don't know what they are? A. I do not know what they are; no, sir.

Q71. Did you ever make inks in accordance with the formula above identified? A. Yes.

Q72. For what purpose were those inks made? (Objected to and question cancelled.)

Q73. Did you make inks exactly in accordance with this formula? A. Yes.

Q74. Did you do it once or more than once? A. More than once.

Q75. Was it, or not, for a time a matter of regular manufacture with you? A. Yes.

(643) Q76. For what? What was done with the ink which you so manufactured? How was the ink used, if you know?

Q77. Go ahead, Mr. Nichols. A. Will you phrase that again?

(Question read.) A. It was sold to printers.

Q78. Do you know that to be true? A. Yes.

Q79. May I ask how you know it? A. By referring to our records.

Q80. By whom?

Q81. After you had manufactured the inks in question what did you do with them? A. I put them in cans and prepared them for sale.

Q82. And in preparing them for sale what did you do? A. I don't understand you.

Q83. This is possibly leading, but I will ask you this: Did you paste labels on the cans or other containers containing any such material? A. Not personally. The man in charge of the shipping department did that part of it.

Q84. Were you, yourself, personally concerned in the manufacture of the inks? A. Yes.

Q85. Did you see any of the inks so manufactured and sold shipped out by the Johnson Company of Cleveland? A. Yes.

Q86. What was the purpose of this ink? A. Shall I go right ahead?

(644) Q87. Yes, if you please? A. This ink, in our opinion, had an advantage over any other ink that we manufactured in that when subjected to heat it was very fast setting and was faster setting than any ink that was supplied by any other ink manufacturer.

Q88. Mr. Nichols, in connection with your manufacture of this ink did you in any way use it and test it? A. I did not use it personally, but I have seen it used. I have also tested it.

Q89. Where? A. In the plant of the Evangelical Press at that time.

Q90. Were any tests made at all in the plant of the Johnson Company? A. We made what I would call crude tests with a proof press and a small electric furnace supplying the heat or, I should say, a small electric hot plate.

Q91. In the course of running those tests did you print sheets with this ink? A. Yes.

Q92. Was it your practice to do so in connection with the various batches of ink that were made up? A. Yes.

Q93. That is, of this kind? A. Yes, sir.

Q94. Would you say that you made such a test of each batch of ink so produced? A. Yes, sir.

Q95. What was your personal experience then with this ink in these tests? A. My experience was that this ink set much more rapidly than any ink that we had produced before.

(645) Q96. The formula, about which we have been speaking, Mr. Nichols, what color of ink was that? A. Black ink.

Q97. I call your attention to another sheet, that you have produced and which you have stated was also a formula sheet upon which, I believe you said, there ap-

peared three formulae for Jirousek's inks. Will you please point out which three of the formulae on that sheet you refer to? A. They are S 59253, perspective process yellow, for the Nels Press, Cleveland; S 59254, perspective process red for the Nels Press of Cleveland; and S 59255, perspective process blue for the Nels Press of Cleveland.

Q98. May I ask you whether or not the term "perspective" or the term "process" or both of them, were terms which were restricted in your use of them to the Jirousek inks at that time? A. The word "perspective" always refers to Mr. Jirousek's inks.

Q99. Considering the formula No. S 59253, and particularly the first three items, "yellow," "yellow" and "orange," what would you say those are or were? A. They are base colors that are supplied to us by our factory in Philadelphia.

Q100. In the regular course of manufacture, or otherwise? A. Well, in the regular process of conducting our business in Cleveland.

Q101. And referring to all three of these formulae, (646) is it true, or not, that the materials set forth as "dry aluminum hydrate", are the same materials that you testified about before, or otherwise? A. They are the same materials.

Q102. In each of these formulae is it correct, or not, that the materials labeled "C. C. S." and "Balc" appear? A. Yes.

Q103. Is your testimony concerning those materials the same as before? A. Yes, sir.

Q104. Do I understand from your testimony that the material marked "Balc" in these formulae is the same as the material marked "Blac" in the formula of Exhibit H? A. Yes.

(Formula sheet marked Defendant's Exhibit I.)

Q105. In the three formulae, to which you have referred, on Defendant's Exhibit Nichols I, I notice the name "Nels

Press". What does that mean? A. That is the printing department of the General Electric Company.

Q106. Does that have anything to do with the inks made under these formulae? A. They were furnished for that customer of ours; yes, sir. That is all.

Q107. As a matter of fact, did they buy these inks, or not? A. Yes, sir.

(647) Q108. Do you recall any of these particular inks being shipped to Nels Press, yourself? A. Not personally. Not without looking up our records.

Q109. Is it, or not, the practice of your company in connection with ink formulae to put down the names of the customers in connection therewith? A. That is right; yes, sir.

Q110. Is that true of the other formulae on Exhibit Nichols I? A. Yes, sir; that is right.

Q111. Is your testimony concerning the personal making of tests by you in connection with the manufacture of inks under the formula of Exhibit Nichols-H applicable to the manufacture of ink under the formulae set forth on Exhibit Nichols I? A. Yes, sir.

Q112. Did you make those inks yourself? A. Yes, sir.

Q113. In the making of these inks, Mr. Nichols, do I correctly understand that what you did was to collect all ingredients, which are set forth in the formula, and put them together? A. That is right.

Q114. How did you do that? A. We followed our regular method of manufacture.

Q115. I mean how did you put them together? A. We take a formula and a mixing pan, and circulate around the plant, stopping at each drum of the particular color that is called for in the formula, and weigh out the designated amount that (648) is in the formula, and in that way we make a batch of ink.

Q116. Well, you spoke of using a pan. Do I understand that you put all the materials in the pan and mix them up in some way? A. They are mixed in a mixing pan, yes.

Q117. Is that what you, yourself, did? A. That is what I did; yes, sir.

Q118. In connection with these inks? A. Yes, sir.

Q119. I note in connection with Exhibit Nichols I that the date of March 10, 1932, appears on all three formulae, about which you have testified, on that page. What does that date signify? A. That is the date that the ink was made.

Q120. Is that also regular practice in your plant? A. That is a regular practice.

Q121. By that I mean it is your practice to enter a formula in your formula book and date it as of the time that the formula was produced? A. That is correct.

Q122. Suppose that you later have occasion to produce more of the same ink, what then happens? A. We refer back to this formula.

Q123. You refer back to the original formula? A. That is correct.

Q124. I will have to ask you for the record whether or not your testimony concerning the date would apply also (649) to the date of February 26, 1932, appearing on formula No. S 58929 as S-58850, of Defendant's Nichols Exhibit H? A. Yes.

Q125. That then would be the date on which you first made a Jirousek ink entitled or called "Perspective H T Black" under the particular formula which is shown on that exhibit? A. That is right; yes, sir.

Q126. Had you made any such inks previous to that time? A. Simply experimental batches of which no formula was recorded.

Q127. You have testified that this ink was made for sale. Do I understand your testimony to be then that the date of the first manufacture of this particular ink, according to the particular formula just referred to, was February 26, 1932? A. Yes, sir.

(650) Mr. Free: Now at page 71, your Honor, Q128 that is the first question after the excluded portion.

The Court: All right.

By Mr. Free:

Q128. I hand you a paper marked for identification as Defendant's Exhibit Theuer F and ask you whether you know what that is. A. This is a piece of advertising matter that we got out with reference to this perspective half tone black.

Q129. When you say "we" whom do you mean? A. The Charles Eneu Johnson Company.

Q130. How did you use that piece of advertising matter?

Mr. Watson: I object to that unless it is within the personal knowledge of this witness. He has not shown that he had anything to do with advertising or sales.

The Court: The objection is good.

By Mr. Free:

Q131. Go ahead. A. In the same manner as any other piece of advertising would be used.

Q132. Well, do you know how it was used, Mr. Nichols? A. Yes. It was distributed——

Mr. Watson: I think that my objection that he does not have personal knowledge of this is good. It is obviously hearsay.

(651) The Court: The objection is sustained.

By Mr. Free:

Q136. Do you know whether or not it was the practice to include that folder in shipments of ink? A. Yes; I believe we did.

Q137. Did you see that done? A. Yes; I would say that I did.

The Court: That is admissible.

Mr. Free: Now, I think it is fair to offer this circular, because that is what he is talking about, Q-1. He identified it personally as having been one of those which was in the shipments which were sent out to the customer.

Mr. Watson: I object to it as entirely immaterial.

The Court: The objection is sustained, advertising matter has no probative value in a situation like this.

Mr. Free: I would like to offer under the same rule the testimony on pages 72 and 73, excluding Q136 and Q137, which were admitted, and then I would like to offer 138 through 141, under the rule.

The Court: You do not have to have permission to do that, do you?

Mr. Free: I would also like (652) to offer this circular in evidence which is now marked Q-1 for identification, under the rule 43(c).

The Court: All right.

The offer of proof under Rule 43(c) is as follows:

Q132. Well, do you know how it was used, Mr. Nichols? A. Yes. It was distributed by salesmen and by direct mail.

Q133. Did you, yourself, ever see any of them going out by direct mail? A. I don't remember.

Q134. Have you ever seen that thing before? A. Yes.

Q135. When, if you recall, did you first see one of those printed pieces? A. Some time shortly after the time that this came out—the date of that I have forgotten—or about that time.

Offer of Proof.

Q138. To what ink does this folder refer? A. It refers to perspective half tone black.

Q139. Do you know whether or not that was, or was not, the same perspective half tone black as is set forth in the formula, about which you have testified, of Defendant's Exhibit Nichols H? A. This folder refers to the perspective black that we manufacture.

Q140. Did you write this circular? A. No.

Q141. I would like to ask you whether or not that perspective half tone black of the formula of Defendant's (653) Exhibit Nichols H was, or was not, the perspective half tone black which the Charles Eneu Johnson Company at that time manufactured, and the purpose of my question is to ask you whether or not this formula is what they made and sold for black ink of that particular kind or whether or not they made several black inks of that kind? A. That is the black ink that we made of that kind.

Mr. Watson: All of the cross examination of that witness relates to statements which were stricken out in accordance with the ruling, and therefore I am not offering any part of that.

The Court: All right.

Mr. Free: I offer Q209 and its answer on page 82 under 43(c). That is still re-direct examination on page 82.

Mr. Watson: That is objected to as relating to the formula which is not in evidence.

The Court: The objection is sustained, and then it can go in as an offer of proof before objection.

Mr. Free: I offered it before the objection, so (654) I do not think the objection means anything.

The Court: You cannot make an objection until you have offered something.

Mr. Free: I offered it under 43(c), and then you objected to it.

Mr. Watson: I should like a suggestion from your Honor as to the procedure to be followed with respect

to Mr. Free's making these offers of proof with respect to which the cross examination relates. I believe that such an offer should tell the complete story, don't you?

The Court: It is right here.

Mr. Watson: It is rather a peculiar situation, I mean, to get a complete story. Suppose this offer of proof goes in and then later it should be held that the testimony is admissible?

The Court: That is for the Court of Appeals, that is all. The offer of proof is made so that, if I decide erroneously, they will have the evidence before them in the record.

Mr. Byerly: I think in making these offers, he should include the cross examination, I mean, if the Court of Appeals should want to consider it that should be included with the offer—we are not offering it—to make a fair statement for the Court of Appeals. If he thinks they will consider the matter he certainly (655) ought to include the cross examination.

The Court: You can offer the cross examination.

Mr. Free: I am not going to offer it.

Mr. Byerly: You offered it under this Rule 43(c).

The Court: He does not have to offer anything he does not want to. You can offer it on condition that it is subject to the ruling of the Appellate Court on his offer.

Mr. Byerly: We will do that.

Mr. Watson: All the cross examination goes in subject to the ruling under the offer of proof, that is, if the proof which has been offered is found acceptable under that condition the cross examination is considered in. Copy all the cross-examination.

The Court: Copy it right in with the offer of proof, the offer of cross-examination. It is material to that.

Offer of Proof.

The offer of proof referred to is as follows:

Cross examination of Lewis E. Nichols.

By Mr. Byerly:

Q142. Your job was that of ink maker in 1932, was it? A. Yes, sir.

Q143. Did you have anything to do with the sale of inks made by you? A. No, sir.

Q.144. Did the company keep records of all its sales, (656) as far as you know? A. Yes, sir.

Q145. You didn't have charge of those records? A. No, sir.

Q146. Did you have charge of these formulae records? A. Yes, sir.

Q147. Did you make up these formulae yourself? A. I did not type them. The original formulae were made out by me and then they were typed into our permanent records.

Q148. You have no knowledge whatever of the composition of these substances which you have called base inks, as I understand you? A. I wouldn't say that I didn't have any knowledge of them because upon that is where I base my skill as an ink maker because of the fact that I do have certain general knowledge of the compositions of these inks.

Q149. You gained that knowledge from mixing them and not from making them though? A. Well, let me amend my answer by saying that I was originally employed at the factory of the Charles Eneu Johnson Company as an ink maker, starting in 1914, and I came to Cleveland in 1919, and then during those years that I was at the factory I did have a general knowledge of basic formulas used to manufacture inks.

(657) Q150. Could you tell without examining the records at Philadelphia whether or not the materials sent out under these numbers here were ever changed in any way?

A. No; not entirely. Let me amend my answer by saying that as we received those base colors from Philadelphia we checked them so that we could maintain a certain standard. If there had been a noticeable change in them we would have noticed it at our Cleveland branch.

Q151. Do you mean that you analyzed them? A. No; we did not analyze them. We just made a physical check.

Q152. Do you mean that you would have noticed a change in the consistency? A. Yes, sir.

Q153. Sometimes you did notice changes? A. Sometimes there were changes in consistency or in the density, or in the strength, of the color. We did that so that we knew that we were working from standard base colors and could supply our customers with a uniform product.

Q154. You did that to check up on what they were doing in Philadelphia? A. That is right.

Q155. Did you check up Mr. Jirousek in any way to see that the composition of his materials didn't change? A. No, sir.

Q156. They were simply handed to you by him? A. That is right.

Q157. You made no analysis to see what they were? (658) A. No.

Q158. You have no personal knowledge as to what he gave you or whether that he gave you one day was the same as what he gave you the next? A. That is correct., I left it up to Mr. Jirousek to see that the material he supplied me was up to a certain standard.

Q159. But you didn't test that material? A. Not personally.

Q160. Was there anybody in the branch there helping you mix these things? A. Our regular employees were around there when this was being done.

Q161. Did you do all the work physically or did some of your help do part of it? A. Well, when it was a question

of making up, for instance, this batch of 72 pounds and the batch of ink and the container would run around 100 or 115 pounds it was necessary for me to get help to lift that weight. That is all the aid I had in the physical end of it.

Q162. You didn't have anyone aid you in making these things together? A. No, sir.

Q163. Did you put the ingredients into an ink mill or just mix them in a pan? A. We mixed them in my mixer.

Q164. Is that some kind of machine? A. We had a regular ink mixer in which the materials were mixed.

(659) Q165. You ran that all yourself in those days? A. Yes, sir.

Q166. Were there any other employees in the ink mixing department that knew what you were doing? A. Yes, sir.

Q167. Who were they? A. Oh, I couldn't tell you that without referring to our employment records. Just who the employees were at that particular time I don't remember.

Q168. Do you have any knowledge of any of them? A. No; not a definite recollection now.

Q169. Was Mr. Jirousek employed by your company? A. No, sir.

Q170. This formula No. S 58929 does not contain the name of any customer, does it? A. No, sir.

Q171. You say that amounted to 72 pounds of ink? A. Yes, sir.

Q172. What proportion of that was material supplied by Mr. Jirousek? A. By referring to the formula, three pounds of "C. C. S." and twelve pounds of "black." That was for this particular formula, S 58929.

Q173. That is, he supplied fifteen pounds out of 72? A. That is correct.

Q174. And the rest of it was just standard ink? A. Yes, sir.

(660) Mr. Yungblut: I think he is in error there.

A. Excuse me. It should be twelve pounds of C. C. S.

Mr. Yungblut: Six pounds of black.

A. Eighteen pounds. That is right.

Q175. Then it was eighteen pounds out of 72? A. That is correct.

Q176. Now, take the first item, 33 pounds of black ink, was that an ink that you could print with just as it was? A. It could be used on a lithographic press.

Q177. Was some of it sold just that way? A. I don't know.

Q178. How about these other inks referred to, could they be used just as they came to you? By "these other inks" I am referring to those of this formula. A. No, sir.

Q179. What was the trouble with them? A. Blue ink, No. C 3841 D, would not print on a letter press without the addition of a varnish. The purple ink, No. P 8848, could not be used on a letter press without the addition of drier. That same statement also applies to bronzine No. F 2532.

Q180. What sort of varnish did you put into that blue ink when you sold it ordinarily? A. A linseed varnish.

Q181. Didn't these materials, as they came to you, contain linseed oil? A. Yes, sir.

(661) Q182. Is this cobalt drier a liquid or a solid? A. It is a liquid.

Q183. You don't know its composition, I suppose? A. I am supposed to know, but I wouldn't say definitely; no.

Q184. It is supposed to make linseed oil oxidize more quickly, isn't it? A. That is correct; yes, sir.

Q185. These three colored inks, that you have referred to, referring to Exhibit Nichols I, were three five-pound batches, weren't they? A. That is correct. I would like to amend that. The yellow was five and a quarter, the red was five and a quarter, and the blue was five pounds. I don't know whether that is important, or not.

Q186. Well, take the yellow, for instance, five and a quarter pounds, how much of that came from Mr. Jirousek? A. Let's get this one right. Twelve ounces.

Q187. Now, take the red. Out of the total of five and a quarter pounds, how much did Mr. Jirousek furnish? A. Twelve ounces.

Q188. Now, is your answer the same with regard to the process blue? A. There were twelve ounces of the blue.

Q189. That is, twelve ounces out of five pounds? A. Yes, sir.

(662) Q190. Is this circular, Exhibit Theuer F, something that Mr. Jirousek wrote? A. I don't know.

Q191. It is a good deal like his line of talk, isn't it? A. I wouldn't say.

Q192. Then you don't know who wrote it? A. No; I do not.

Q193. On Exhibit Nichols H who wrote in the figure 5 in pencil in the first item of the formula? Do you know? A. I don't know.

Q194. When you made up another batch of any one of your formulas was any record of that made anywhere? A. Yes, sir.

Q195. If there was a change in the formula in later batches, was that recorded somewhere? A. Yes, sir.

Q196. Have you examined the records to see whether or not this perspective black formula was changed? A. No, sir.

Q197. How long is it since you made up a batch of this formula S 58929? A. This batch of S 58929 was made up on the 26th of February, 1932, according to the records.

Q198. Is that the last batch that you ever made? A. No, sir.

Q199. When did you make the last batch? A. I cannot say definitely without referring to our records.

Q200. It was quite a while ago, wasn't it? A. Yes, sir.

(663) Q201. Did you ever make up more than one batch of any of the three formulas of Exhibit Nichols I? A. I don't know.

Q202. Do you know whether or not Mr. Shearer wrote this circular? A. I don't know that.

Q203. You know Mr. Shearer, don't you? A. Yes, sir.

Q204. Was he employed by the Johnson Company at the time that you were? A. Yes, sir.

Q205. What was his job? A. He was the Cleveland Branch Manager.

Q206. He was your boss, wasn't he? A. He was my boss; yes, sir.

Q207. How long did he stay with the company? A. He left in May, 1932.

Q208. You don't remember the names of any of the employees of the company who had any knowledge of your work in mixing these inks? A. Not without referring to our records at that time.

Re-direct examination of Lewis E. Nichols by Mr. Yunglblut:

Q209. Mr. Nichols; on the formula, about which you have been testifying, of Exhibit Nichols H, I notice the word "stock" on the line marked "for". Could you tell me what that means? A. Yes. In this particular instance we made up a batch of 72 pounds and packaged it, and then (664) placed it in our stock with the idea of selling it, either all of it or part of it, as the occasion arose.

Deposition read in evidence of Clayton H. Benjamin produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Exec:

Q1. Mr. Benjamin, will you state your age, please? A. Sixty-four.

Q2. What is your full name? A. Clayton H. Benjamin.

Q3. Your residence, Mr. Benjamin? A. 3710 Maplecrest Avenue, Parma, Ohio.

Q4. Where are you now employed, Mr. Benjamin? A. Charles Eneu Johnson & Company.

Q5. In what capacity? A. Manager of the branch.

Q6. What branch is that? A. Cleveland branch.

Q7. Where is the office of that branch located? A. East 21st and Superior.

Q8. For how long have you been with the Charles Eneu Johnson & Company? A. It is between 30 and 40 years.

Q9. How long have you been Manager of the Cleveland branch? A. Ten years.

Q10. Before you were Manager of the Cleveland branch office what were you doing? A. Salesman.

Q11. For the Charles Eneu Johnson Company? A. Yes, sir.

Q12. And what was its business? A. Manufacturing of (665) printing and lithographic inks.

Q13. And are those the substances you sold or sell? A. Yes, sir.

Q14. In the course of your selling work did you contact printers and users of inks? A. Yes, sir.

Q15. Did the Charles Eneu Johnson Company at any time manufacture and sell an ink called perspective half tone black? A. Yes, sir.

Q15a. Mr. Benjamin, did you ever sell any perspective half tone black ink for the Charles Eneu Johnson Company? A. Yes, sir.

Q16. What kind of ink was it?

Mr. Watson. I object to that urless the witness has personal knowledge of the composition of the ink.

Mr. Free: He is talking about the physical characteristics of it here.

Mr. Watson: I believe the answer is meaningless, unless we have something with respect to the composition of this material.

The Court: He knows it as a quick-acting ink. Would not that identify it as a particular class or type of ink?

Mr. Free: Yes.

Mr. Watson: Unless we have something saying what it was made of. The fact that it was a quick-acting (666) ink, so-called, is absolutely meaningless. It does not get us any forwarder.

Mr. Free: We have here a lot of testimony in the prima facie case of printers talking about the characteristics of ink. They knew nothing at all about the composition, and that is all this testimony has to do with it. He can say, I think, that the ink was thus and so when it was printed, namely, it was a quick-drying ink.

The Court: Quick-drying ink I suppose in the trade is a particular type of ink that people engaged in that business would know about and would not know the details of it, just like I might know a Ford car and would not know how to make one.

Mr. Watson: That is true.

The Court: The objection is overruled.

By Mr. Free:

Q17. Go ahead and answer the question. A. It was known as a quick setting ink.

Q18. What does that mean? A. It sets very quickly, but it wasn't dry. It just sets.

Q19. When did you, yourself, begin to sell perspective half tone black ink, as you recall? A. As nearly as I can recall it, it was in March, 1932.

Q20. Did you sell any of it? A. Yes, sir.

(667) Q21. Did you have occasion to see it being used by customers who had bought it from you? A. Yes, sir.

Q22. Can you give us an example of a time when you saw it being used and tell us what sort of use it was being put to? A. It was being used on half tone work.

Q23. By whom, for example? Do you have a particular customer in mind? A. A. L. Garber Company of Ashland was one.

Q24. Is that Ashland, Ohio? A. That is right.

Q25. Is that a printing establishment? A. Yes, sir.

Q26. Did you see perspective half tone black ink which you had sold them being used in that plant? A. Yes, sir.

Q27. Can you tell us a little something about that use and how they were using it, and what was happening? A. I don't know as I quite understand your question. It was used on half tone work. I don't recollect what the work was. I know I made a trip down there just to see it work.

Q28. They were using it on a printing press, were they? A. Yes.

Q29. And did you note anything concerning its drying characteristics as used on that press?

Q30. Go ahead and answer, please. A. It set very rapidly.

(668) Q31. Well, just in an effort to get you to tell us something about what you observed there, I will ask you: How do you know that it set very rapidly? A. Well, they would print a sheet on one side and turn it over, I would say, within twenty minutes, and print on the other side of it and not scratch the first side that was printed. It wasn't dry, but it set so that it wouldn't rub the printing. You could smear it if you rubbed it, you understand.

Q32. Do I understand from your testimony that when a sheet had been run through the press and was printed you could then rub it and if— A. Well, if you rubbed it hard enough you could cause a smear, but if it was handled right you could not. I don't know just how to explain it. You can see the ink flattened out on the sheet, but there is no moisture left on the surface.

Q33. Did it, or not, have a tendency to offset on the other sheets? A. No; it didn't.

Q34. You saw that in action, did you, at the Garber Company plant? A. Yes, sir.

Q35. Were they at that time running what is sometimes called a turn over job? A. Oh, yes. Almost all jobs are printed on both sides. I think it was tried out; in fact, I know that it was tried out that way to see what it would do. I don't recollect what job it was now.

(669) Q36. Do you recollect whether or not in passing through the press the second time it offset, or not, on the tympan or make ready? A. As far as I know, it didn't.

Q37. I take it from your testimony that you made a sale of that ink to the Garber Company in Ashland, Ohio? A. Yes, sir.

Q38. Have you any record of that sale? A. Yes, sir.

Q39. Have you it with you? A. No, sir.

Q40. Is such a record available? A. We have the record in the office yes.

Q41. Do you have with you any records of any of your sales? A. No, sir.

Q42. You didn't bring those? A. No, sir.

Q43. In connection with your selling of perspective half tone black ink was any printed matter or advertising matter employed by you? A. Yes.

Q44. I hand you a paper which is marked Defendant's Exhibit Theuer F and ask you if you know what that is? A. Yes, sir.

Mr. Watson: I think that your exclusion of the advertising matter also excludes this testimony with respect to it. You have previously excluded the other testimony about that. I think the same ruling applies to this.

(670) The Court: There is no objection, is there?

Mr. Free: No, there is no objection. There has been a general objection.

The Court: I have admitted that, have I (referring to circular)?

Mr. Free: No, but this is another man who knows about it.

The Court: What is the probative value of advertising matter? It is just self-serving and boosting and not supposed to be a careful statement of fact.

Mr. Free: It describes this ink back in 1932 when this was printed, and to that extent it does show us what this ink was and is not self-serving, if your Honor pleases, because we did not make the statement, the defendant did not make the statement.

Mr. Watson: If that is the case the author of the circular should have been produced for cross examination.

The Court: The objection is sustained.

Mr. Free: I think I will offer it a little differently, in this way, as merely an illustration of the ink which was printed on this paper, without offering the context of the circular. It is the ink itself.

The Court: That is another way of beating the (671) devil around the bush.

Mr. Watson: I think that is all it could be. Until we have some proof as to the composition of the ink I think it is entirely immaterial.

The Court: The objection is sustained.

The offer of proof under Rule 43(c) is as follows:

Q44. I hand you a paper which is marked Defendant's Exhibit Q-1 under Rule 43(c) and ask you if you know what that is? A. Yes, sir.

Q45. What is it? A. That is a perspective blac-

Q46. Well, is that such a piece of advertising as you referred to in your former answer? A. Yes, sir.

Q47. Did you ever use it? A. Yes, sir.

Q48. What use did you make of it? A. I gave it to my customers.

Q49. And when was that, approximately, if you recall? A. It was in March, but we might have had some in late (673) February. I wouldn't be positive about it. It was in March, I know.

Q50. In what year, Mr. Benjamin? A. 1932.

Q51. Have you any idea about how much of this ink was sold by yourself? A. No, sir.

Q52. Do you know whether or not this ink in 1932 was sold regularly by the Charles Eneu Johnson Company? A. Yes, sir.

Q53. You were not then the only salesman selling it? A. No, sir.

Q54. As to the matter of satisfaction or lack of it by your customers with that ink, what would you say? A. I would say that in general it was satisfactory.

(672) Q55. Do you have any way of knowing that? A. Not except the sales that were made.

Q56. Were, or not, some of those sales reorders? A. Oh, yes.

Q57. Are such sales records, as I have referred to, available? A. Well, they are in the customers' files. I would have to get permission from Mr. Harkness.

Q58. Do you mean to produce them? A. Yes, sir. I don't feel free to produce them without his permission. We have them there.

Q59. Those customers' files are the regular files of your company, are they? A. Yes, sir.

Direct examination resumed by Mr. Free:

Q60. Do you happen to know whether or not a sales record exists of the sales which you made to the Garber Company, which you have mentioned? A. I beg your pardon.

Q61. I say, do you happen to know whether or not there is a sales record anywhere of the sales made to the Garber Company, that you have mentioned? A. Oh, yes; there is.

Q62. You have that sales record, do you not? A. Yes, sir.

Q63. At your office? A. Yes, sir. We have that and several others.

Q64. As to the composition of the perspective half tone black ink which you sold, as you have stated, were you familiar with the composition of it? A. No, sir.

Q65. You didn't know about it? A. No, sir.

Q66. Did you, yourself, sell any perspective colors other than black at that time, do you recall? A. No; I don't think so.

Q67. Your sales then were confined to the black? A. Yes, sir.

(674) Q68. Was the Johnson Company at that time manufacturing any other quick setting inks, as you call them? A. Any other one?

Q69. Yes. A. No.

Mr. Watson: There was an objection here to strike out all the testimony of the witness claimed to be based on records that were not produced.

The Court: I have been following that. I do not think he testified to anything that was not based on the record.

Mr. Watson: Later on he did produce records of his sales. I was just wondering what the objection was made at that time. Perhaps Mr. Free would like to turn over to the subsequent testimony.

The Court: Before you go on with the cross?

Mr. Watson: Yes.

Mr. Free: On page 133 he has been put back on the stand after he got the records.

The Court: Each item ought to be headed Evidence to which objection was sustained by the Court but offered under Rule 43(c).

By Mr. Free:

Q90. I asked you, Mr. Benjamin, to look through your records and pick out some records of sales of perspective half tone black made by you, and you have done so, I take (675) it? A. Yes, sir.

Q91. Will you please produce those records? A. There is one for The Commercial Printing & Lithograph Company. Perhaps I should start with the first sale. There are 50 pounds, ten fives, perspective half tone black, No. S 58,850, one dollar per pound, $50.

Q92. Just a moment, Mr. Benjamin. You have produced two book-like folders here and I would like to ask you what they are. A. They are files in which we keep individual customer's sales.

Q93. Each of these book-like folders is a file for an individual customer, is it? A. That is right.

Q94. These are the regular files of your company? A. Those are our regular files, yes.

Q95. Where did you get them? A. From our file cases which are made up as the orders come in.

Q96. And did you get them just this afternoon? A. Yes, sir.

Q97. What designation does this sheet have, Mr. Benjamin? A. AA 8088.

Q98. Does your name appear on that page, Mr. Benjamin? A. It does.

Q99. What does that indicate? A. I made the sale or I got credit for the sale whether I made it, or not.

Q100. Do you think you made it, or not? A. Yes, sir.

(676) Q101. You made that sale personally? A. Yes.

Q102. You called attention to another paper. What was it? A. That was a reorder from the first one.

I offer in evidence as Defendant's Exhibits S-1 and T-1 of the Commercial Printing & Litho Company order and reorder identified by the witness, of the ink which he has sold under this name "perspective half tone black."

(Marked Defendant's Exhibits S-1 and T-1.)

Mr. Free: (Continuing)

Q103. What does that represent, Mr. Benjamin? A. A sale of 20 fives or 100 pounds, perspective half tone black, S 58,850.

Q104. Did you also make that sale? A. Yes, sir.

Q105. Does your name appear on the paper? A. Yes, sir.

Q106. The first sale, as evidenced by Exhibit S-1, when was that made? A. March 8, 1932. That is the date that it was billed. The sale was made a day or two prior to that.

Q107. That is, a day or two prior to March 8, 1932? A. Yes.

Q108. What would you say as to Exhibit T-1? A. The same would be true of this.

Q109. What is the date of the bill?

Q110. What year? A. 1932.

(677) Q111. And the date is so marked on it? A. Yes, sir.

Q112. Do you testify that you made both of these sales to this one company? A. Yes, sir.

Q113. And that the material noted on the exhibits as Perspective H T Black is the Jirousek ink of which you spoke in your former testimony? A. Yes, sir.

Q114. Turn to the second booklet. For what company is that folder? A. The A. L. Garber Company, Ashland, Ohio.

Q115. You have called my attention to a paper therein. What does that paper represent? A. A sale of perspective half tone black.

Q116. To whom? A. The A. L. Garber Company.

Q117. Who made that sale? A. I am not positive whether Mr. Hill or I made it. It was in Mr. Hill's territory and his name appears on the sheet.

Q118. Is the A. L. Garber Company noted on this paper the same A. L. Garber Company that you testified about in your former appearance here? A. Yes, sir.

Mr. Free: I offer as Defendant's Exhibit U-1 the sales slip of the A. L. Garber Company, dated March 2, 1932.

(Marked Defendant's Exhibit U-1.)

Cross examination by Mr. Watson:

Q70. Your company sold a lot of other kinds of inks besides this perspective black; is that correct? A. Yes, sir.

Q71. And were any of those other inks satisfactory to your customers? A. I believe they were.

Q72. This is just one of a great many items that you were selling at that time, isn't it? A. Yes, sir.

* * * * * *

Q78. Did you actually gauge the length of time between printing one side and backing up or printing on the other side? A. I didn't understand that question. Will you ask it again?

Q79. That is, at Garber's? A. I think so; yes, sir.

Q80. You actually timed it? A. I don't think that I timed it with my watch, no.

Q81. You don't think you did, do you? A. Mr. Shearer was with me that day and he was handling the situation.

Q82. You really don't know how long it was before they (679) backed them up? A. In that particular job, no.

Q83. Is your company still selling this perspective half tone ink? A. We are selling a perspective half tone ink, yes.

Q84. The same formula as the other? A. I don't know.

Q85. You have nothing to do with the formulas, do you? A. No, sir.

Q86. Does your company sell any quick drying inks for use on rotary web presses? A. I believe they do; yes, sir.

Q87. How long have you been doing that? A. Oh, a number of years.

Q88. Three or four years? A. Yes; I would say so.

* * * * * * *

Q120. You, yourself, have no knowledge of the composition of this ink referred to in these several statements, have you? A. No, sir.

Re-direct examination by Mr. Free:

Q121. Mr. Benjamin, are the sales represented by these papers, Exhibits S-1, T-1, and U-1, respectively, the only sales of perspectiv half tone black ink of which you have knowledge? A. No, sir.

(680) Q122. Are these just representative ones which you have picked out at my request? A. Yes, sir.

Deposition read in evidence of FRANK PELLINGER produced as a witness for defendant, who, being first duly sworn, deposed and said:

Direct examination by Mr. Free:

Q1. Will you please state your name, age and residence? A. Frank Pellinger; 35 years; 4223 West 56th Street, Cleveland, Ohio.

Q2. Mr. Pellinger, by whom are you now employed? A. Tower Press.

Q3. And how long have you worked for the Tower Press? A. It will be eight years.

Q4. And before that time by whom were you employed? A. With the Evangelical Press.

Q5. And the Tower Press is a sort of successor to the Evangelical, is it? A. Yes.

Q6. Evangelical was located in the same place? A. Yes.

Q7. And that place is where? A. 1,900 Superior Avenue.

Q8. You are a pressman, are you not? A. Yes, sir.

Q9. And you have continuously been a pressman throughout the period of your employment both by Evangelical and Tower? A. I started with Evangelical and served my apprenticeship with Evangelical, and I worked (681) into a pressman.

Q10. How long did you work for Evangelical or from what date, if you can remember? A. I believe it was about 1922 or '23; somewhere about there, I believe.

Q11. That you came with the Evangelical Press? A. I think it was that time.

Q12. How soon after that did you become a pressman? A. That is kind of hard to say because they used me as a helper and a pressman when they were rushed. Of course, I think that I actually became a pressman when we went over into the new building and I think I started as a press-

man at Tower Press; that is, that is when I started actually to be a pressman there.

Q13. Did you know, or do you know, a Mr. Joseph F. Jirousek? A. Yes, sir.

Q14. Who is he? A. He was our shop superintendent in the press room or the shop foreman in the press room.

Q15. At Evangelical or Tower? A. At Evangelical.

Q16. When did he come with Evangelical, if you know? A. I believe it was around 1932 or '31 possibly. Either 1931 or '32; something like that, he started in there. I don't remember exactly the dates.

Q17. At that time were you running a press at Evangelical? A. I was running a press with a pressman over me; that is, I would run the press and he would see (682) that I done everything right so that I could go ahead and run the job off.

Q18. And then you would finish the run? A. Well, I got so that I could manage the press by myself without his help, but still I was under him as his helper yet.

Q19. Do you remember whether or not the Evangelical Press printed a magazine called Metal Progress? A. Yes.

Q20. Did they start the printing of that magazine after you were there? A. Yes; after I was there.

Q21. And do you know whether or not they have continued to print it up to date? A. They have.

Q22. When does that magazine come out? A. It comes out once a month. It is a monthly magazine.

Q23. Has that been true throughout its history? A. Yes; that was true when they started and it has been run every month since, to my knowledge.

Q24. And at what time would the actual printing be done, oh, let us say, of the December issue of Metal Progress? A. That is a little bit hard to say for the simple reason that it varies. It depends upon what we can

get together. It should be out on the 5th of the month, but it varies. Now, for instance, this month, we are just about ready to run it through. The last form is on the press now. We are just finishing up the last form of the December issue of Metal Progress.

(683) Q25. Today, did you say? A. Yes.

Q26. So that you don't always get it out on a certain day? A. I cannot specify any certain time because it comes in at various times. I can tell you that sometimes we run the cover before they have any of the inside ready and lots of times they run the cover after the inside is all finished. They are waiting for the cover.

Q27. When you say that it comes to you at various times I suppose you are referring to the copy of the magazine? A. When we get our final O.K.

Q28. How long does it take you to print the average issue of Metal Progress? A. That is something else that is very hard to answer.

(684) Q29. That varies also? A. That varies also because sometimes they get a couple of forms and then we have to wait a couple of days before they get another one. It is hard to say.

Q30. Is it something that can all be done in one day? A. No.

Q31. I hand you a magazine, Mr. Pellinger, which has been marked Defendant's Exhibit O-1 and ask you if you know what that is? A. Yes; that is the cover of Metal Progress.

Q32. Well, is it one of the covers or is it the whole thing? A. Well, it is the whole book.

Q33. Does that book bear a date? A. Yes. September, 1931.

Q34. Do you recognize that as anything which you printed? A. Yes; this is very familiar to me.

Q35. Do you recall the printing of that particular issue? A. Yes.

Q36. When would you say that the cover of that issue, let us say, was printed? A. Well, it might have been printed the first part of September or it might have been printed the latter part of the previous month.

Q37. In what year? A. 1931.

Q38. But it would have been in that range of time? A. Yes.

(685) Q39. I will ask you to examine that cover and state if you recall any circumstances connected with the printing of it? A. Well, now, what do you mean by that? Do you mean as far as the running of the cover is concerned?

Q40. Yes. A. Well, would you kindly tell me what you really mean, what you want me to answer?

Q41. I will rephrase the question, Mr. Pellinger. How many colors are there on that cover? A. Three colors.

Q42. Can you tell by looking at that cover or from your own recollection the order in which those colors were printed? A. The silver was run first.

Q43. And then what? A. I would say that the black was run next and then the orange.

Q44. Are you testifying now from an examination of that cover or do you recall that that is what you did in printing that magazine? A. Well, I can swear to it that the silver was run first, but I don't know for sure whether the black or the orange was run next. Wait a second. By looking at the back I can tell that the black was run and then the orange was run, but I know for a fact that the silver was run first.

Q45. I take it from your testimony that that is a cover which you, yourself, printed? A. Yes.

Q46. Do you recall doing so? A. Yes.

Q47. Were you at that time a pressman or a pressman's (686) helper? Do you know now? A. I would say that I was both. I was helper and pressman on it.

Q48. Did you have any difficulty in printing that cover? A. I think that as far as my memory serves me right, we had a little trouble with this silver on here.

Q49. What were you using then in the way of silver, if you know? A. I believe at that time we were mixing our own formula. What I mean by "formula" is that we had the silver powder and the varnish, and we mixed the two of them together.

Q50. And did you do that or was it done? A. It was done; yes.

Q51. The material was furnished to you and you said that you had some trouble with it? A. Yes.

Q52. What kind of trouble was that? A. I believe we had trouble with this rubbing off here because it wouldn't dry thoroughly; that is, the silver would flake up here and we would have the silver drying after being printed, and it was so hard that the black wouldn't take on it. It wouldn't be a solid enough black on the cover.

Q53. Did you overcome that difficulty? A. Yes, after mixing it differently; that is, after Joe Jirousek had fixed up some ink that he had mixed up, and he finally got it down to where we wanted it, so that it would dry all right.

(687) Q54. Well, then, if I understand your testimony, you were having difficulty with the cover until Mr. Jirousek fixed you up some ink? A. Yes, sir.

Q55. What ink did he fix up? That is, which color or colors? A. He fixed up the black; that is, the silver, to start off with. Then he worked up something on the black so that it would take this silver a little better.

Q56. If I understand your testimony, he fixed up such an ink and brought it to you to use, did he? A. Yes.

Q57. And did you use it? A. Yes, sir; I used it.

Q58. And did that correct the trouble that you were having? A. Yes; it seemed to work very satisfactorily.

Q59. Can you tell us something about how it worked, Mr. Pellinger? A. It seemed that it worked a little bit better than what we had before and it seemed that we could handle it a little sooner than if we used the other stuff. If we didn't handle it soon enough, then it would dry too fast. That is, with the other ink. With this ink Jirousek had mixed up it seemed that we could run right away on it.

Q60. And by running right away do I understand you to mean that— A. We could follow the black right up with the silver.

Q61. That is, in a second printing operation? A. Yes.

Q62. What about the drying of that ink? Did it dry (688) more slowly or more rapidly, as you recall it? A. It seemed that it dried a little more rapidly on the paper. It seemed to dry more rapidly.

Q63. In what way were you running those covers? Will you describe that to me? That is, as a printing job, what kind of job was it? What press did you use? A. We used what we call a No. 4 swing back feeder on a small press which was just about the right size for a job like this, for this kind of cover to run on.

Q64. You are talking about the particular cover on the September, 1931, issue of Metal Progress, aren't you? A. Yes.

Q65. This was a swing back press? A. Swing back feeder; that is right.

Q66. What sort of press was that? Was it a rotary press? A. No; it was what we call a regular cylinder press, flat bed.

Q67. How did you run that cover? What part of it did you print on each side of the sheet or on any one side of the sheet? A. Well, we ran the silver on one side and then the black.

Q68. The cover has four pages, has it not? A. Well, as it is finished.

Q69. Which of those four pages would you print at the same time on any one side of the sheet? A. We print all four (689) pages on one side of the sheet.

Q70. Then what do you do with the sheet after that? A. Turn the sheet over and run the same four pages again.

Q71. Did you use any heat or flame on your press? A. Why, yes; we used a good deal higher flame or hotter fire on it than we did on the previous jobs; that is, we would turn our gas up higher.

Q72. How many of those covers do you recall running, if you do recall, Mr. Pellinger? A. I think that we ran somewhere in the neighborhood of 8,000. I think it was about 8,000 or something like that; perhaps eight or nine thousand; I don't recall offhand.

Q73. Would that be covers or only— A. It would be the whole book.

Q74. You would print more than 8,000 books? A. More than 8,000 books; yes.

Q75. And that would mean how many printings of the cover? A. Well, that would mean 4,000 sheets for 8,000 copies.

Q76. When you had run the 4,000 sheets through your press the first time what did you then do? A. Well, we ran, say, about 2,000 of the silver, took them over and ran them on the black, let the silver keep running on that one side there until they finished up on one side of the 4,000, brought them all over to the black and ran them through on the black, (690) turned the sheets over in order to back with the silver again, run your silver through and work it back on to the black.

Q77. When you speak of taking it over do you mean taking it over to another press? A. That is right.

Q78. And was there any waiting between running off the first two thousand and the running of the second two thousand? A. No; there wasn't a very long wait. By the time

we got the first two thousand off the black the silver from the other press would be dry enough so that you could put it in and run it through on the black.

Q79. Then, if I understand your testimony correctly, what you did was to run these sheets through a press that was set up to print the silver? A. Yes.

Q80. And when two thousand of them had passed through that press you right away took those two thousand over, as you call it, to a second press which printed the black, and you ran them through that press? A. Yes.

Q81. Something has been said here about offsetting. Did you have any offset trouble? A. We did for the first, say, one hundred sheets or so until we got the color down to where we wanted it, and after we got it down to where we wanted it, then it worked all right for us. Then we didn't have any further trouble with it at all.

Q82. What do your mean by getting the color down to (691) where you wanted it? How would you go about meeting this situation? A. Well, all inks vary. The same way with the stock. It all varies. Some will take one ink. Some with take more ink. Some will take less ink. If you carry too much ink on one side of the paper, it will offset on you.

Q83. Well, as I understand your testimony, what you mean by getting it down to where you want it is that you adjust the fountain of the press? A. Adjust the fountain, yes.

Q84. Is that something that you ordinarily have to do in starting a run on a printing press? A. Yes. Any job, any kind of paper, any kind of ink, that has to be done.

Q85. Then your testimony, as I understand it, is that when you had your fountain adjusted you then had no more trouble with this cover in the way of offsetting? A. No trouble.

Q86. Are you speaking now about any particular colors or about all of them on that cover? A. Well, I don't really know. I don't remember much about this orange, how we

happened to do with that, but I do remember the silver and the black. This orange, I think that was a standard ink that they had down there and I don't think that they mixed anything with this.

(692) Q87. Did you know what Mr. Jirousek mixed in his ink to get this effect? A. No; that is something I couldn't tell you.

Q88. And was that the only issue of Metal Progress that you recall using any ink specially mixed up by Mr. Jirousek? A. No; I don't think it is. I think we ran several issues. I don't remember now how many there were or what they were at that time.

Q89. I have here several issues of Metal Progress and I would like to have you look them over, and see whether or not you recognize any others of this group as being ones in which Mr. Jirousek's ink was employed. A. To tell you the truth, these magazines all look familiar to me because I ran them. This is one of them, I remember.

Mr. Free: The witness has pointed to a magazine which I will have marked for identification as Defendant's Exhibit V-1.

(Marked Defendant's Exhibit V-1 for identification.)

A. Now, here is another one. I think I remember running this one here with that ink.

Mr. Free: The witness has referred to an issue of Metal Progress dated January, 1932, which I will have marked for identification as Defendant's Exhibit W-1 for identification.

(Marked Defendant's Exhibit W-1 for identification.)

(693) The Witness: I remember running these, but I don't remember whether he had his ink lined up on them, or not.

Q90. You referred, Mr. Pellinger, to an issue of Metal Progress dated December, 1931, heretofore marked Exhibit Theuer G. You stated, I believe, that you recall running that cover? A. Yes.

Q91. Did you run it yourself? A. Yes.

Q92. And that cover was printed with Mr. Jirousek's ink, was it? A. I believe it was.

Q93. Which of his colors was the ink that you are referring to, or did he fix up both inks? A. I believe he fixed up both inks on this.

Q94. And the colors of those inks are what? A. They are the red and the black.

Q95. With Mr. Jirousek's inks were you able to run that cover satisfactorily? A. I was.

Q96. Did it make what you considered a good printing job? A. Yes.

Q97. I call your attention to a magazine known as Metal Progress, dated January, 1932, which has been marked for identification as Defendant's Exhibit W-1, and which I believe you also stated was run with Mr. Jirousek's ink; is that correct? A. Yes.

Q98. You ran that yourself, did you? A. Yes.

Q99. How many colors are there on that cover? A. The (694) blue and the black.

Q100. Were both of those Mr. Jirousek's inks, or not? A. I am pretty sure that it was run from the inks that Mr. Jirousek had mixed up.

Q101. Are you referring to one color or both? A. I believe it was both colors on that.

Q102. And that is Exhibit W-1 for identification? A. Yes.

Mr. Free: I offer in evidence as Defendant's Exhibits V-1 and W-1, the two magazines previously identified by the same letters for identification, V-1 being the issue of Metal Progress dated December 1931, and W-1 being the issue of Metal Progress for January 1932.

Mr. Watson: I object, your Honor, on the ground that the composition of the ink used has not been shown. It is immaterial and irrelevant.

Mr. Free: Well, he said it was a physical magazine run with that ink which had the physical characteristics after being heated.

The Court: Objection overruled.

(Defendant's Exhibits V-1 and W-1 for identification received in evidence.)

The Court: We will take a recess at this point.

(Short recess.)

Mr. Free: I will offer this September 1931 issue (695) of Metal Progress formerly marked Defendant's Exhibit O-1 for identification.

Mr. Watson: I object to it on the ground that it is immaterial. The ink used in it was not proved.

The Court: Well, it was proved that it was a quick-drying ink.

Mr. Free: Yes.

The Court: It is admitted for that purpose, a quick-drying ink job.

Mr. Free: Yes, the same as the other ink jobs.

(Defendant's Exhibit O-1 for identification received in evidence.)

By Mr. Free:

Q103. Do you recall whether or not you ran other covers for Metal Progress than the three that you have identified with Mr. Jirousek's ink? A. Yes, I think we ran several of them, but I don't recall distinctly just which ones they were. Precisely, I know that there were several of them, but I don't remember which ones.

Q104. Do you recall whether or not any jobs besides the Metal Progress covers were run with Mr. Jirousek's inks

by you? A. Yes; there was one in particular that they were running at that time. That was the Garden and Home.

Q105. Was that a magazine? A. Yes; that was a magazine.

(696) Q106. Was it a monthly magazine? A. Yes.

Q107. I have here some issues of Garden and Home Magazine. I will show them to you and ask you whether or not you can point out any of them as having been run with Mr. Jirousek's ink? A. I believe that these were run with Mr. Jirousek's ink.

Q108. By "these" do you mean one or more of the group of three magazines that I have handed you? A. I think that all three of them were run with them, as much as I can remember.

Mr. Free: I now offer in evidence as Defendant's Exhibit X-1, "Your Garden and Home," issue of January 1932; as Defendant's Exhibit Y-1, the February 1932 issue of "Your Garden and Home Magazine"; as Defendant's Exhibit Z-1, the March 1932 issue of "Your Garden and Home Magazine".

Mr. Watson: The same objection, your Honor.

The Court: Let me see them.

(Exhibits handed to the Court.)

Mr. Free: The same thing, your Honor, quick-drying ink.

The Court: All right.

(Marked Defendant's Exhibits X-1, Y-1 and Z-1.)

By Mr. Free:

Q109. Referring to Exhibit W-1, dated January, 1932, you have testified that you recall printing that. When did (697) you print it, approximately, if you can tell us? A.

Well, January 1932, probably the early part of the month, or it might have been December, the latter part of December 1931. It was along in there, but I don't remember just what part of the month it was.

Q110. In other words, the exhibit, about which I have been asking you, would have been printed either in the early part of the month for which it is dated or in the latter part of the preceding month? A. That is right.

Q111. Would that be true also of Exhibit V-1? A. Yes.

Q112. How about Exhibits X-1, Y-1 and Z-1? When would they have been printed by you, if you know? Exhibit X-1 bears date of March 1932. When was that printed, if you recall? A. That is something that I can't remember now. I don't remember when it was printed, but I would say that it was printed in the latter part of the previous month when it was dated, when it was supposed to be issued out, but whether it was printed in the same month that it is dated, I don't remember that because they have stopped printing that altogether.

Q113. Would it have been printed within, say, thirty days of the 1st of the month marked on it, either way? A. Either way, yes. I would say yes, either way.

Q114. You say that this magazine is no longer printed? A. Not that I know of. It isn't printed by us anyway. I (698) don't know if it is or not, but I don't think it is on the market now.

Q115. Do you recall when the Evangelical Press stopped printing this magazine called Your Garden and Home? A. That I can't tell you. I don't remember.

Q116. Mr. Pellinger, did you like these Jirousek inks? A. Yes; I would say that they were fairly satisfactory. They worked very well.

Q117. Just what do you mean by that? What did they accomplish? What did they do? A. Well, it seemed that we got away from quite a bit of offset. That was our main trouble.

Q118. For the sake of the record, Mr. Pellinger, what do you mean by "offset"? A. Well, what I mean by offset is that when you lay one sheet on top of the other the sheet that is on the bottom will sometimes smudge on the back of the sheet that is on the top. It will cause a smudge on there.

Q119. Does offsetting occur on the press itself? A. Well, it will at times. No; not on the press. More of what we call offset is on the paper itself.

Q120. What happens to the press on a work and turn job on the second run if the ink is not thoroughly set? A. Well, if it isn't thoroughly set it usually starts piling up on the back or on the tympan paper that is on (699) the cylinder. It is an oil paper and it starts piling up on there wherever there is any impression from the other side on that side.

Q121. What effect, if any, did the Jirousek ink have on that action? A. Well, we found out that in short runs—what we mean by "short runs," when there is only a couple of hundred runs or so—that we can back the job up, say, within fifteen minutes to half an hour sooner than—oh, it might be longer than that, but we could back it up sooner than we can with any ordinary ink. We found that out.

Q122. What about the printing of one color on top of another? Is that affected in any way by the rate of the setting of the ink? A. Well, it is if your one color isn't dry enough, that your other color sometimes will not take on there.

Q123. And what effect, if any, on that situation did the Jirousek ink have? A. Well, we found out that we could run from one press, if the job is on two presses—we found out that you can run from one press to the other, and you can run so many thousands and then take it right over on the other press and continue with the other one.

Q124. One of the witnesses here mentioned a spray in connection with offsetting. Can you tell us what that is?

A. Well, that is a solution that they use, which (700) is blown through a gun, and it comes out in real fine powder which lays in between the two sheets, and that holds the sheet up off the other sheet just long enough so that the bottom sheet is set. What we mean by "set" is so that it won't offset on the top sheet.

Q125. Does that enable you to work and turn faster? A. No; I wouldn't say it enables us to work and turn your job faster. No; I wouldn't say that.

Q126. You have said that it prevents offsetting. Under what circumstances does it do so; that is to say, where? A. Well, on the paper itself.

Q127. That is, when it is being stacked? A. When it is being piled up; yes.

Q128. At the end of the press? A. Yes.

Q129. But, as I understand your testimony, that doesn't enable you to work and turn any faster? A. No; that has nothing to do with the ink; that is, as far as the drying power of it is concerned.

Q130. You didn't use sprays in connection with the Jirousek ink, did you? A. No; we didn't have that at that time.

Cross examination by Mr. Watson:

Q131. Have you ever seen three-color printing on a rotary web press? A. No; I haven't, to be honest with you.

(701) Q132. You don't know whether one color is put down on the other when they are both wet, do you? A. I have heard that it is done, but I have never seen it or never worked with it.

Q133. Now, I don't exactly understand your testimony. You say that you printed this silver color. Where is the silver color? Was the sheet you started with the size of the front and back cover together or was it bigger than that? A. It is twice that size.

Q134. Twice that size? A. Twice that size, yes.

Q135. And you were operating two printing presses at the same time; is that right? A. Well, I was helper on the one and another fellow was working on the other, but we worked together on it.

Q136. What was the first thing that you did? A. Well, now, what do you mean by that?

Q137. Well, suppose you are ready to print this cover. Just what do you do? What was the first thing that you did? A. After we got it all on and got our position O. K., got it made ready, put our ink in the fountain.

Q138. Which ink? A. The silver.

Q139. On one or both presses? A. One press.

Q140. Then what did you do? A. Started running it.

Q141. The other press wasn't running? A. No; it wasn't running yet.

(702) Q142. And did that just print solid silver all over here or were there some breaks in it? A. No; that was just one page. Silver was just on the one page. Just one page was run silver.

Q143. Well, then, there was in the press some kind of a solid block to print that piece of silver? A. That is right.

Q145. That is all you printed, isn't it? That is all you were printing on this press that was running the silver then? A. That is all.

Q146. How many sheets did you run through that press? A. Do you mean the amount run on the job or——

Q147. Well, did you do anything else before you had run all the sheets through that press? A. Of course, we watched it. We ran through to get our color checked O.K., to see if the color was even all the way across and then, of course, to see if it offset, or not, on the back.

Q148. What was there to make it offset? You were just printing on one side then, weren't you? A. Why, yes, (703) but, you see, you are laying one sheet on top of another sheet.

Q149. Do you mean that it offset in the pile? A. In the pile; yes, sir. That is the only way you can get offset is when you are piling stock.

Q150. I see. And then when you were satisfied that it wasn't offsetting too much you kept running all your sheets through that one press? A. Yes.

Q151. Now, was the other press standing still all that time? A. No; we were making ready on that press.

Q152. You weren't running on it? A. Not until we got a certain amount of the silver ones off so that we could go ahead and put it on the other press.

Q153. Well, now, how many of the silver ones did you get off before you started running on the other press? A. I would say probably half of the job; that is, half of——

Q154. Would you say that was about two thousand sheets? A. That would be about it if the run was eight thousand.

Q155. About how long does it take to print two thousand sheets? A. The time varies. Say, probably an hour. I mean from about an hour and fifteen minutes to an hour and a half, two thousand, or as much as two hours. It depends upon how much trouble we had with it in starting it up.

(704) Q156. Well, then, at the end of, say, two hours you take these two thousand sheets, that have silver on them, and carry them over to the other press? A. Well, yes; we took them over to the other press.

Q157. What did you do in the other press? A. We take them and, as we say, repile them. You pile them in from the top down so that the first ones that you started with on the silver were started on the black. Consequently, those are the driest ones. So, we started from there again.

Q158. When did you print that? How did you print on the second press? A. I believe it was the black that we run, the following color, on that particular issue.

Q159. On which side of the paper did you print it? I mean was it on the same side as the silver? A. The same side as the silver.

Q160. The same side as the silver? A. The same side as the silver.

Q161. It came right down on the silver? A. Yes.

Q162. Well, what was the next step after that? A. Well, after we had finished the silver and got a certain amount of the black on, or maybe we got the whole color off it—I don't know how it panned out, but right away then the next step is to back it up on the other side of the sheet.

(705) Q163. Well, how about the yellow or the orange? Did you do anything about that? A. No; we didn't do anything about it until the silver was off because at that particular time, I believe, that cover was made on those two presses, those two swing back presses.

Q164. That is after you got the silver and black printed on one side of each sheet? A. Yes.

Q165. You did the same thing with the other side, printed the silver and black on the other side? A. Yes, sir.

Q166. Then, as I understand it, your double sheet was a duplicate of this sheet that we see here on the magazine? That is, you had two plates printing silver on two different parts of your double sheet; isn't that correct? A. No; we only had one plate. We only had one silver plate there.

Q167. Did you print on both sides of the sheet? A. Yes, sir. What was printed on the first side was printed on the second side.

Q168. Then you cut them apart afterwards? A. Yes, sir.

(706) Q169. Well, then, after you got the silver and black all printed on both sides, what did you do next? That is, did you clean up the presses? A. We cleaned up the presses, certainly. Well, I think before they got the black done they had the silver all off; that is, they run it on the black on the second side. When your silver is done the press

is cleaned up and your orange is put on. When the black is finished, it goes over and the orange is registered in, made ready, and your fountain set, color set, and you are ready to run.

Q170. Then you have to put all the sheets through the orange press twice, don't you? A. That is right.

Q171. How much time elapsed between the time you finished the black and silver on the one side before you backed up with the black and silver on the other side? A. That time now I wouldn't know exactly. It might have been possible that we got through with it at quitting time; that is, if we got enough of the black off on one side, and then in the morning we could start backing them up.

Q172. Well, this is, in general, the same way that you operated with all linseed oil inks? A. I don't know anything about running with linseed oil or anything like that.

Q173. You have never had anything to do with (707) linseed oil? You didn't know that there was any linseed oil in any of these inks? A. I couldn't tell you today what any of the inks have got in them because all our inks come, as a rule, mixed up. They are already in the cans, and all we have to do is to put them in the fountains.

Q174. You have talked about Jirousek's ink or inks. How did you tell them from any other ink? A. Well, the only way that I could tell them from others was that there was an odor, but if the odor was here right now I couldn't tell you what it was like.

Q175. Did you see Mr. Jirousek mixing up ink? A. I have seen him mixing up things back there, yes.

Q176. He never told you what he put in them? A. No, sir.

Q177. When he got one mixed up he would say, "Try this"? A. Yes.

Q178. If it didn't work, then he would mix up something else and say, "Try this"? A. Yes.

Q179. You would try another if one didn't work? A. Yes, sir.

Q180. You would try different ones until you succeeded in getting one that would do the job? A. Yes, sir.

Q181. But, after all, there were other inks that you could buy that would work on a job of this kind, weren't there? A. I didn't understand what you said.

Q182. I say, there were other things that you could (708) have gotten or could have bought that would have worked on a job like this? A. Oh, I imagine you could have gotten other inks, but I guess the idea was that they wouldn't set fast enough and at that particular time, if I am not too much mistaken, we mixed our own silver up. We had the silver. We got the base. I think we bought the silver and the varnish base separately.

Q183. Did you do that with all your silver ink? A. At that time, yes.

Q184. And did Mr. Jirousek mix them all or did somebody else mix some of them? A. Well, at times, before he got on to his own ink, why, we would mix them ourselves; that is, we would mix up the silver and the varnish together. Sometimes we got too much of one or the other in there because we never had any set formula on it.

Q185. Now, looking at this issue of Metal Progress, March, 1932, I notice that there is some silver printing on a page of it, page 64. Did you have any trouble in printing that page? A. That I don't know anything about.

Q186. You didn't print that? A. No.

Q187. You didn't print any of the inside of this magazine? A. No.

Q188. You have a very good memory for what you (709) printed so long ago, haven't you? A. Well, I have been down there long enough.

Q189. Do you remember everything that you printed between that time and this time? A. I will tell you if I see some of it. I have a vague recollection of it, but to tell you offhand what this is and that is, I can't say.

Q190. It is pretty hard to remember which of these things were printed with inks that you got out of stock

and which of them Mr. Jirousek mixed up, isn't it? A. Of course, there were a few of them that we had inks that we took special notice of and several of these covers have been run again, but not with this ink. He wasn't there when they were run.

Q191. I see. They ran some of them the second time, did they? A. Yes. We had sprays at that time. You see, they were probably run two or three, or four, years apart, or even five years apart.

Q192. When did you get the spray? A. I would say about three or four years ago; something like that.

Q193. Of course, the sprays had nothing to do with one color being printed over the other? A. What did you say?

Q194. I say, the sprays had nothing to do with the way one color printed over the other? Did you tell us (710) that? A. As far as printing one color over the other, the spray had nothing to do with it. The only thing that the spray did have anything to do with was the offset. It eliminated the offset.

Q195. And so far as printing one color over another was concerned, you did that after Jirousek went away, and you were still able to do it, weren't you? A. We did the best we could with it.

Q196. It didn't come out so bad, did it? A. At times it did. At other times it didn't. It depends upon what the ink was.

Q197. It made some difference in the kind of paper you had, too, didn't it? A. Well, it depends upon the different kinds of stock that you have to use, but that Metal Progress always used just that one certain kind of stock.

Q198. Do you mean that they haven't changed the stock since 1932? A. They might have, but I don't know. I wouldn't say offhand if they had, or not, but it is pretty near the same as it always has been.

Q199. It is the same kind of stock as the other magazines that you have there? A. Which one? Do you mean these here?

Q200. Yes. A. I don't know.

Mr. Watson: Referring to Defendant's Exhibits (711) X-1, Y-1 and Z-1.

(Continuing.)

Q201. You don't know whether that is the same stock, or not? A. It is not.

Q202. It is not the same stock? A. No.

Q203. It is a softer paper, isn't it? A. Yes; it is a softer paper.

Q204. Going back to this September, 1931, magazine, do you remember whether or not you had any trouble with the orange offsetting? A. I don't think that we had so much trouble with it because we didn't have to run it as heavy on that.

Q205. That is the one that you printed on top of the others, isn't it? A. Yes, sir; I believe that was the last one that was run on that.

Re-direct examination by Mr. Free:

Q206. Mr. Pellinger, you spoke about repeating covers in Metal Progress. Do they do that sometimes? A. They do it sometimes, yes.

Q207. How often do they repeat their covers? A. It is hard to say. It all varies.

Q208. Would they re-use a cover, for instance, in the same year? A. No; I don't believe they would.

Q209. Have they ever done so, to your knowledge? A. I don't think so.

(712) Q210. Do you know whether or not they have? A. Do you mean run the same cover in the same year?

Q211. Yes. A. I am sure that they haven't.

Q212. When they repeat a cover, do they, or not, change the date on the magazine? A. They change the date on the magazine, yes.

Q213. I believe you stated that in running the cover of Exhibit D you sent the sheets through one of the presses first and printed the silver on one side; is that correct? A. That is right; yes, sir.

Q214. And then before you had finished running the four thousand sheets that you had to run through that press, after you had run only about two thousand of them you took that two thousand over to a press for printing the black and began to run the black? A. Yes.

Q215. And then you finished your silver run on that side of the paper while the black was running? A. That is right.

Q216. Then you took a certain quantity of the black and reversed those sheets and transferred them back to the silver press again, did you not? A. Yes.

Q217. What was that quantity, approximately? Was it the same as before or different? A. I would say that possibly it might have been a little different. It might not have been quite as many.

(713) Q218. In other words, if I understand you, you started running the sheets through your silver press, printed a certain number, then you started the second press, then you started running them through the black press after printing the silver on them—does that question make sense? A. I can't make any sense out of it.

Q219. Then I will try again. You said that you began to run the black after you had run thousand silver? A. That is right; yes.

Q220. And then you said that you began to run the silver again on the other side? A. On the second side.

Q221. On the second side after having printed the back a little sooner. Now, I was simply trying to understand what you mean by that. A. Oh, I see what you mean now. In other words, what I meant was that we have been able to back the job up a good deal sooner than if we had other ink. What I mean is, this ink, it turned out that it dried a good deal faster and it was possible to start over on the other press. Now, how much time there was between start-

ing on the second side of the silver and when we finished, that is, since starting that color and running so many off, and take it over on the silver, I don't know. I can't say what time was lost in between the two times on the two presses.

(714) Q222. In other words, you wouldn't be able to say then, if I understand you correctly, that after having run two thousand of the black impressions you then began to back up with silver? A. Not me. I wouldn't say. That was probably within half an hour or an hour. If it turned out that way, of course, I don't remember. It might have been that we got through or we got enough of them through on one side when it came to quitting time, so that they lay overnight, and in the morning we would start to back them up again.

Q223. Would the same thing in general be true in connection with running the second silver and black impression on the second side of the sheet? A. It would be the same condition.

Q224. In running the second silver impression then I take it you ran about two thousand of those and then switched those printed copies over to the black press again? A. Yes.

Q225. Is that something which you could do with other inks with which you were familiar at that time? A. Well, we couldn't exactly do that that way. We had to let them set for a certain length of time so that they would be dry enough so that we could put them in the press, but we couldn't let them lay too long or we couldn't let them dry too much, with silver at that time.

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(715) Mr. Free: I will now offer extracts from the deposition of Peter Dennerlein, a plaintiff's witness.

Extracts read in evidence from deposition of Peter Dennerlein, Manufacturing Director of Crowell-Collier Publishing Company (Extracts from this deposition previously read in evidence are printed at record, pp. 235-238).

Direct examination by Mr. Watson:

The Witness: The rotogravure ink contains a more volatile solvent and is a very thin liquid type ink and evaporates very quickly, by the mere blowing across it of some hot air whose temperature is approximately 135 degrees Fahrenheit.

* * * * * *

(716) *Cross examination by Mr. Free:*

Q. You spoke a moment ago about the speed of printing of rotogravure. That is about 1200—— A. 1200 feet a minute; yes.

Q. How does that compare with the heat-set letter press ink? A. It is faster; the highest speed we have run the paper in letter press printing is 800 feet a minute. That is true as to printing with two colors and not four.

Q. How do you compare the quality of the printing through rotogravure to letter press printing with the heat-set process? A. Mr. Free, that depends entirely upon who you speak to.

Q. I am speaking to you as a printing expert. A. Thank you for the compliment. I have been a great exponent of rotogravure and I have seen it develop in the last seven years much beyond my belief or imagination, in seven years; and today I claim that the best rotogravure is better than the best letter press, although both depend on the human element, and as long as you have the human element you will have some not as good as the other in both processes.

Q. I have been told that printing according to the heat-set process is a sort of compromise in order to obtain speed;

that is, you sacrifice quality of printing to get (717) speed. Is that a fair statement? A. Not in my opinion; no. Of course, if you try to obtain too much speed in letter press, why, of course you run into two difficulties. One, you use so much heat in order to dry your ink that you dry some of the ink even before it gets on to the sheet, and therefore it does not trap harmoniously—you are talking of four colors?

Q. Yes. A. In two colors I would say the only difficulties encountered now are at the delivery end of the press. If you deliver them in flat sheets you cannot lay your sheets down fast enough. If you deliver them in folded units or signatures—there has not been a folder built that will get rid of the printed product fast enough for the printing press.

I think furthermore that some printers have tried to get so many pages on to a cylinder that they have widened out the press to such an extent that they simply couldn't keep quality up. I am thinking of some who have 65-inch cylinders in length or width, and we believe that is entirely too wide. We use 48-inch cylinders. To put it probably in better terms, we have four rows of plates per cylinder and they have six, and I think that also is a stumbling block in getting the best quality that could be gotten from the process.

(718) Q. How would you compare the quality of letter press printing with heat-set ink with the quality of printing done with the old oil varnish inks? A. Well, there again it depends entirely on the nature of the colors you print. I believe black, or black and one color, will trap and the heat flash ink product is much superior to the old oil or varnish type of ink. In four colors I think the best "Vaporin" or heat-set ink job is in most cases just as good except when they try to get too much speed or use an inferior sheet of paper.

Q. You spoke of speed several times. Can you remember from your recollection as to whether or not the speed of

presses has increased progressively year by year since say 10 or 12 years ago? A. Yes; not year by year, but there have been three steps forward. The sheet feed and the four-color or merely color press, improved by Cottrell, printed on one side of the sheet in four colors and on flat sheets. It was first stepped up in speed by the elimination of what was then a slip sheet or blotter through the introduction of wax which was sprayed on, first melted and sprayed on,—paraffin was sprayed on the printed sheet, and we were immediately enabled to get a higher production.

The next step forward was the introduction (719) of a roll-fed press, or web type press. You start with a roll of paper instead of feeding the paper to the press in sheets, and immediately got higher speed. From that we went into the perfecting press 4-4 and about the same time we got the high speed two-color press printing two colors on both sides. The presses were built more rigid and enabled us to get higher speed because of the type of ink we were using which was again the "Vaporin" or heat-set or heat flash ink.

Q. Now I also have been told that an ink maker is a sort of a custom tailor,—he fits his ink to correspond to the requirements of the job; that true? A. Fits it to suit the job; yes.

Q. And so as the speed of the presses increased, you had to change your ink to conform for example? A. That is correct.

Q. As a matter of fact the first heat-set ink which you saw or knew about back in 1935 is quite different from the ink which you are now using, is it not? A. Well, are you speaking from the standpoint of a two-color or a four-color?

Q. We will take the two-color first and talk about the four colors later, if you please. A. I think the ink maker has improved his two-color inks in the past seven years.

They weren't quite as stable in 1935 as they (720) are today; and the same with the four-color inks. Of course the first time I ever used four-color inks of a heat flash or "Vaporin" type was in 1937—late '37 or early '38.

Q. Those include the Levey inks? A. And they improved too, as to stability and in their harmonious laying on top of each other and having the right consistency in each succeeding color, and they also dry better.

Q. So it has been pretty much of a progressive improvement in inks ever since you saw them? A. Yes.

Q. Now as to stability of the early inks; as I understand it, in 1935 you sometimes had trouble with the ink drying on the roller and the result was the web would tear and break; that true? A. Yes, that is true of the heat flash ink, and also true of oil type inks. In other words if they try to crowd too much drier in it, the inks will perform in approximately the same way,—the ink would dry on the press and also have a tendency to dry on the plates and therefore break the web.

Q. In case of heat flash ink it was instability due to evaporation of the solvent, was it not? A. Well, I would imagine; I think that is true.

Q. Now I also understand you know quite a lot about the manufacture of inks? A. For the record? —is this off the record?

(721) Q. No. A. Well, I supervised the making of ink from 1928 until I left Dayton in 1937. We made very little heat flash inks. The fact is we didn't want to make them.

Q. In those early inks that you purchased from I.P.I.—1935 I believe you said? A. Yes.

Q. When you were with McCall's? A. Yes.

Q. Do you know what sort of a solvent that ink contained? A. No.

Q. You do know, however, the solvent in use was different than the solvent which was in the 1935 ink? A. I really couldn't answer that intelligently because I don't know the types of solvent, if there are two being used or if

there is a different type of solvent being used. They tell us, but what it actually is, I don't know.

Q. Did you ever have trouble with your composition rolls in 1935 with I.P.I. ink? A. The only reason we had any trouble with our printing rolls was the fact we had the heat so close to the print rolls that they were exposed to the heater, and in the later type of press, why, that was taken care of by moving the oven or lengthening the leads and seeing the heater wasn't too close or as close as before to the printing rollers.

(722) Q. How hot do those ovens get, about? A. Well, of course it depends entirely on the speed of the press. I am quite sure it is around 1400 degrees.

Q. Fahrenheit? A. Fahrenheit, yes. We don't use that much heat but some people do. We use about 950 degrees I think.

Q. Now as the speed of the presses increase and they had been running for about an hour or so, they develop considerable heat by reason of friction and tack in the ink rolls? A. Yes, they do.

Q. Have you any idea how hot they get? A. No.

Q. But they get pretty hot? A. Well, you can still put your hand on it. It is probably 100 or 120 degrees.

Q. Fahrenheit? A. Yes.

Q. So if the ink is stable on the cold press it might not be stable after the press had been running for a while because of the heat development; that right? A. Well, I really never actually ran into that difficulty. It is safe to assume if the ink was not made to be stable at that temperature, why, it would evaporate more rapidly or too rapidly.

Q. I have been told that one of the improvements that have been made in heat-set inks to avoid that very difficulty was the substitution of a higher boiling (723) solvent which would not evaporate after the press began to run. Do you know about that? A. No, I do not.

Q. Now insofar as rotogravure inks are concerned, the solvent there as I understand it is much more volatile than

the solvent used in the flash or heat flash ink; that right? A. Well, one solvent is more volatile, or because of the nature of the ink we can use more solvent. I am not in a position to say.

Q. Both the rotogravure and heat-set process work out the same in that respect; that the ink is applied to the web and then the web is heated?— A. Yes.

Q. The difference being that with heat flash ink you use higher heat than you do with rotogravure ink?' A. That is correct.

Q. Now from your experience as an ink maker, isn't it the practice to thicken thin ink by putting in more resin? A. No, my practice in thickening ink was to put in a heavier varnish. We used to add a No. 5 varnish which was more like glue which would hardly flow, thereby creating more tack which was necessary in order to make the colors ride on top of each properly to get the proper mixture of the colors for the printing effect.

Q. You mentioned Levey inks as having been used by you in 1935 at McCall's? A. In 1935?—1937.

Q. Was that the first heat flash ink that you knew (724) about? A. No; not the first heat flash ink because we used "Vaporin" ink from I. P. I. in 1935, and I came in contact with Levey in 1937 when I first came to Springfield.

Q. Was the Levey ink different from the I. P. I. ink? A. Not as far as the printer was concerned.

Q. Did you ever hear when you were at McCall's of similar heat-set ink sold by Charles Eneu Johnson Co. called Perspective half-tone black? A. Yes, I did.

Q. When was that, do you know? A. 1935, or it may have been 1936. I really couldn't say but it was thereabouts.

Q. Was it before you first used the "Vaporin" ink? A. No.

Q. Now, as the speed of the presses increased you merely changed the ink as I understand it; that right? A. The speed of the presses increase? —well, of course that was a major change from the oil type of inks to "Vaporin" or heat flash type of inks.

Q. And again you conformed the inks to fit the press requirement as always in those instances, that right? A. We never changed any of the "Vaporin" or heat flash inks in their consistency or in the amount of solvents or the amount of varnish or the amount of drier. We either used it as it came or rejected it and made the (725) ink man change it.

Q. Did you ever have occasion to spray rollers? A. Yes.

Q. With I. P. I. ink in the fountain? A. Yes, when we shut down for a long period such as making a change, in making ready the rollers, where we didn't know it would be done for a half hour or for an hour, we would spray a solution which was supplied by them which would retard the drying of the ink on the rollers; we had it on both I. P. I.—in fact on all heat flash inks.

Q. When you made your own heat flash ink at McCall's, what solvent did you use, do you know? A. No.

Q. Was it classified as a petroleum solvent or organic solvent? A. I can't really tell you about that. No, really I can't.

Q. You had been using a tympan on rotogravure printing?— A. No.

Q. The ink is dry as it comes out of the press? A. Yes.

Mr. Free: I do not think I will read the rest of the cross examination, unless, you want it.

Mr. Byerly: We will put some of this in in rebuttal on the question of commercial success. I won't offer any at this time.

* * * * * *

(726) By Mr. Free:

Q. Did you have heat-set inks in operation at any time when any Sinclair & Carroll representative visited your plant prior to your first purchase from them? A. No. The only time they saw any competitive ink running was on a similar press running next to their own. We had men com-

ing from Levey and I.P.I. or Sinclair & Carroll, or anyone who furnishes ink. They are at liberty to come in here and watch the performance, in fact we encourage it, to see how an ink is performing and behaving.

* * * * * * *

Q. You have been questioned on web feed presses and sheet delivery presses. I would like to ask you whether heat-set ink would work as well on one as the other providing the heat was used at delivery end? A. Well, it makes no difference as far as the ink and the heat are concerned whether you deliver it in sheets or in folded signatures. If you deliver it in folded signatures you naturally are having to run higher speed because you don't have a way of letting your sheets set as they come out of the press.

Q. A flat bed press would work just as well with heat-set ink if you had the proper heater, wouldn't it? (727) A. Correct; yes.

Q. Now as a former ink man, in order to make an ink which would evaporate less fast than say rotogravure ink, you would simply use a higher boiling solvent in it; wouldn't you? A. Less fast than the rotogravure ink?

Q. Yes. A. I would use less solvent.

Q. Or putting it in another way, you would use a solvent which would not evaporate as fast, wouldn't you? A. That is true.

Q. That is just plain horse sense, isn't it? A. I don't know whether it is horse sense or not, but I sometimes accuse the ink makers of not having any horse sense; at other times they do things which really floor me.

Q. I am asking you about your horse sense; you would do a thing like that; that is plain horse sense, as far as you are concerned? A. I would naturally call in the solvent manufacturers and start to manipulate.

Deposition of Peter Dennerlein, for Plaintiff—Re-direct—Re-cross.

Q. You go to the solvent manufacturers and say, I want an ink which does not evaporate so fast, have you a solvent which would do the job? A. They may not be able to tell me, but I would try it out.

Q. And if they had a solvent you would try it out? A. I think I would; yes. I always told the ink makers—the manufacturers, when they solicited me, I don't care (728) what you put in the ink as long as it works.

Q. And you buy ink from whomever can furnish the best ink—the ink you want, don't you? A. Well, the best ink and at the best price.

Re-direct examination by Mr. Watson:

Q. Going back to what an ink maker might do with a gravure ink to make a letter press ink. A mere change in solvent would not change one to the other, would it? A. I don't think you can make it, no, I don't think you can. You cannot make a letter press ink with simply solvent because you have to have a varnish in there to give you the necessary tack.

The Court: What do you mean by tack, stickiness?

Mr. Byerly: Yes.

Q. You never did try to make a letter press ink of a gravure ink? A. No.

Re-cross examination by Mr. Free:

Q. If you wanted to make a letter press ink which evaporated less fast than rotogravure ink you would use a higher boiling solvent in the l[illegible]r press ink, wouldn't you? A. Not necessarily; I may use [illegible]ame solvent but by the mere introduction of varnish I would reduce the volatility of the ink.

(729) Q. So you have to use higher heat to dry it. Another way of doing it would be to use a higher boiling solvent? A. I don't know; that is getting pretty technical now. I am afraid I would have to get back into the laboratory to find it out.

Q. If you had such a condition you would ask the solvent man if he had something to do the job? A. I would ask him what solvents he had and try them out to see if they work.

Mr. Free: That is all.

The Court: What have you got next week?

Mr. Free: I have some witnesses, about two days of it.

The Court: How much have you got, Mr. Byerly?

Mr. Byerly: I think two days. It is a little hard for me to be sure until I see what my brother puts in, but I should think it would take at least two days.

(Adjourned to January 25, 1943, 10:30 a. m.)

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(730) New York, January 25, 1943;

10:30 o'clock A. M.

TRIAL RESUMED.

Mr. Free: Mr. Carroll.

ROY CARROLL, called as a witness on behalf of the defendant, being duly sworn, testified as follows:

(731) *Direct examination by Mr. Free:*

Q. Mr. Carroll, where do you live and what is your occupation? A. I live at 73 Locust Road, Winnetka, Illinois—a suburb of Chicago.

Q. And your occupation? A. My occupation—I am in charge of the Sinclair & Carroll Company of Chicago business.

Q. You are an officer of the company, are you not? A. Yes.

Q. And what is your office? A. I am vice-president.

Q. Now give us a brief description of the products produced by Sinclair & Carroll Company. A. We produce about every type of printing ink for the letter press and offset printing field. We manufacture them from the raw material, making them into inks; adjust them to the requirements of our different customer's printing presses.

Q. And what sort of inks are those? What is the general classification? A. Oh, I term the general classification the common ordinary oil type of ink as always used, namely, linseed varnish.

Q. And that is the large proportion of your business? A. That is the large proportion of our business.

Q. Do you make any other kinds of inks? A. Offset printing inks.

(732) Q. Any other—like heat-set? A. Heat-set, yes. We made heat-set, too, and are making them.

Q. Now when did you start in the printing business? Give us a brief description of your experience and history in it. A. In 1913 I first started to work in the printing ink business, and I have been in the business ever since with the exception of a period of about fourteen months during the last World War.

Q. How did you start? Tell us about that.

The Court: Are you talking about him or his company?

Mr. Free: No, about him, his own history.

The Court: Very well.

A. Well, in the most ordinary job, that is, of color matcher where you begin to learn about blending colors together, which later on leads to the formulation of printing inks from

the raw material. I was doing that during most of the time before the last World War. On my return from the Army I worked for a short period in New York and then was sent to Chicago as a salesman for the company I was working for. In 1923, I believe it was, we organized the Sinclair & Carroll Printing Ink Company and I have worked consistently ever since for the same firm.

Q. How large is your company in the field? A. We (733) are considered small. We try to grow but we have our limitations because we haven't got the resources.

The Court: You say you have been with this company since when?

The Witness: Sinclair & Carroll since 1923. That was the date of its organization.

Q. Now you keep pretty closely in touch with the manufacture of inks in your Chicago plant, do you not? A. Oh, yes; I do.

Q. And I believe you said a while ago that you matched inks to the press and printing conditions and requirements of your customers? A. Yes. I supervise them closely along with our plant formula.

Q. It has been said here that a printing ink is a tailor-made job. It must fit the particular requirements of the job to be done, is that right?

Mr Byerly: Your Honor, it seems to us that is rather leading. He cannot cross examine this witness.

The Court: Objection overruled.

A. That is true.

Q. And when you make up an ink what do you want to know?

The Court: That is a little leading.

Mr. Free: Yes.

The Court: But it is preliminary.

(734) Mr. Free: Well, I am saving time.
The Court: We know what his line is.
Mr. Free: Will you read the last question?

Q. (Read.) (Continuing) From the customer: A. Oh, I want to know the type of press, the speed of the press, the kind of paper stock. Those are the general—or rather that is the general information that we have to have.

Q. And from that information state whether or not you fit your inks accordingly? A. Oh, yes, we fit them accordingly, always do.

Q. Now in the manufacture of inks tell us whether or not you buy your ingredients from outside sources? A. Oh, yes. We do buy our raw material, such as the varnishes and the oils and the resins and the colored pigments—all our raw material we buy.

Q. Tell us whether or not from time to time you use new products as they come on the market? A. Oh, yes. I watch the trade journals to see if there is anything new coming up in our field, and when they do, why I try to formulate inks that will give the same approximate consistency to the one we are supplying, and find out if it works better.

Q. And all that has to do with price and so on? A. Oh, yes, price considered.

(735) Q. Tell us how you got into this heat-set ink business. A. To me it was more or less of a natural condition. We had a very good customer in Chicago who we had sold ever since we have been in business. In fact, if it was not for their business, why, we would have had a much harder struggle getting started. And they equipped a press with heat, and I asked for an opportunity of supplying ink for it. I did not know how we were going to make it at the time, but I knew it was just one more problem that had to be worked on, and we developed an ink that would run on that press.

Q. And the requirements of that ink were what? A. The requirements of the ink were resin, a solvent and a

plasticizer. That constituted the vehicle. Then we had to find the proper color, see which color ground better in the varnish. You may have two different colors and they may flow differently. We had to find that out.

The Court: What do you mean by grind the pigment, you mean the mixing of it?

The Witness: You have to process it. You take the varnish and then you mix it on a chain can mixer, and we mix them up just as they do in a bakery, and that makes a paste out of the varnish and the pigment. From there it goes to the printing ink mill, and in the printing (736) ink mill there are three iron rollers, two rollers turn in, the front roller turns out, and there is an apron on it with a sharp, straight razor-edge blade that scrapes it off, and it falls into a can below. That operation may be repeated two, three, four or five different times, according to the hardness of the pigment.

The Court: And that roller grinds the pigment?

The Witness: That roller grinds the pigment.

The Court: What is the condition of the pigment when it starts through that machine, is it a powder?

The Witness: It is a sort of a muddy mixture, as if you mixed mud and water together, for the first run.

The Court: I mean when you first put it in the dough.

The Witness: When you put it in the dough it is just powder and varnish thrown on top of it. The powder is spread fine, but it is not fine enough to run on a printing press.

Q. What were the physical requirements of heat-set ink for its operation on the press, for example? A. It had to set and dry after passing through the heater on the press.

(737) Q. How about during printing and on the roller, what was it supposed to do? A. The ink was supposed to

be stable enough so that it did not evaporate before it went through the oven.

Q. You mentioned oven; what kind of an oven did they have on that first press that you saw? Hall was the name of the customer you had reference to? A. The name of the customer I had reference to was the W. F. Hall Company in Chicago.

Q. Please describe the heater you saw on that first press? A. The heater was sort of a box with a slit at the entrance and a slit at the end, through which the web of paper ran, and it ran through the heater after printing the first side, and there was a second heater through which it ran after printing the second side of the sheet.

Q. How was that heater heated? A. It had a gas burner for it.

Q. Was it pretty hot? A. Very hot. I would not go near it.

Q. In the development of heat-set inks when was it that you saw that first press that you have described? A. In the early part of 1938.

Q. Where did you get the material from which the solvent, for example, and the resins, were made? (738) A. I tried what material I had in my own plant first. We had the resin there. I tried a paraffin oil that we had always used for a good many years, and I found it was not quite satisfactory. So as the oil salesman came in I asked him for an oil that would do that kind of work.

The Court: Do what kind of work?

The Witness: To evaporate after it passes through the heater and to evaporate completely, cleanly.

The Court: Was it necessary to make these inks dry?

The Witness: Yes.

Q. You say you asked the oil salesman; what happened after that? A. They put in samples and I made up varnishes from the solvents they sent in.

Q. With those varnishes what did you do? A. I ground the pigment in them. I worked on a four-color process, ground yellow in the heat-set varnish, then red, then black and then blue.

Q. Did you try those inks out on the press? A. Yes, I did.

Q. How long after you saw the press in 1938 was that? A. Oh, I imagine it was about a month.

Q. Have you tried out those inks? A. Yes.

Q. And how did they work on that press? A. I was (739) satisfied that I had made progress, but they were not satisfied enough. So I went back to the plant and made corrections, which were very successful.

Q. Are those corrections that are commonly made or not with all inks? A. We always make corrections to suit the paper stock.

Q. Did you ever hear of Magie Bros. Petroleum Products Company? A. Yes.

Q. I show you some invoices, which are here in evidence as K-1, K-2, K-3 and K-4, inclusive, and ask you whether that is your company whose name appears as the addressee? A. That is.

Q. And that oil was used in what inks? A. In our heat-set inks.

Q. For what customer? A. Crowell-Collier.

The Court: What is the date?

Mr. Free: January 1941.

Q. Tell us whether or not you have been making and selling heat-set inks ever since that first experience with Hall in 1938?

The Court: He has not fixed any dates at all.

Mr. Free: Yes, he said he made the first ink for Hall in 1938.

Q. (Read.) A. Yes.

Q. I show you a Montgomery-Ward catalog section which (740) is here in evidence as Defendant's Exhibit F-1, and ask you if you ever saw that before? A. I have.

Q. Tell us what you know about it.

Mr. Byerly: I object to further evidence on this until the defendant meets your Honor's requirement that we be provided with samples for the analysis of the inks with which this was printed. This is of the nature of an ex parte test, and no information as to what was printed was furnished us.

Mr. Free: The inks will be in in about five minutes.

The Court: Have you got them in the court-room?

Mr. Free: Yes.

The Court: Objection overruled.

Q. I ask you to tell us what you know about that F-1 exhibit. A. We made these printing inks up according to the McElroy patent, which consisted mainly of three ingredients, in fact entirely of three ingredients. We adhered to those three ingredients in making the formula. We made up approximately 300, 250 to 300 pounds, brought it up to the Hall plant and put it on the printing press. We adjusted the consistencies for trapping purposes.

Q. Tell us what you mean by trapping? A. The first color printed is usually yellow, then comes red and then (741) either black or blue. The first color has to have a consistency, pasty and tacky enough to take the next color. Then the third color has to be a little softer than the second and the fourth the softest of all to get good trapping conditions. Otherwise you would get sort of a blur on purples with the red and blue mixed together.

Q. Will you go on with your story and tell us what you did with the inks according to your personal observation, at Hall's? A. We added a little more of the solvent called terpineol.

Q. Why was that done? A. We had to soften up the colors to trap better, and we also had to soften them up so that it did not pull the paper, otherwise if it is too tacky you would just pull the hide off the paper stock.

The Court: You mean it sticks?

The Witness: Yes, if you put your finger down in the ink and lift up your thumb, it sticks. The action on the press is just the same, it pulls the coating off the sheet.

(742) The Court: What does that do, create a vacuum or sticking effect?

The Witness: Well that shows your condition of the paper stock. If it is so soft that the finger could pull it off, then you have to be very careful on the press and soften up the inks for this. As a rule this paper stock is heavy, so that that does not happen.

The Court: Is the pressure of the printing roller on the paper very heavy or very light?

The Witness: It just gives it a kiss impression, just to print, with enough pressure to print, to place enough make-ready to force it up to the paper and keep the solid solid instead of just fuzzy.

Q. I think you are using terms we may not know. What do you mean by "make-ready"? A. Well, I am not a printer, but I know the printer uses some make-ready on the press to help the printing condition of the plate, to make the relief figure stand out.

Q. This circular which you have before you, Defendant's Exhibit F-1, tell us whether or not you actually saw that printed, come off the press? A. I was there at the start and at the finish. It was on the press a couple of hours. Then we ran down on the amount of ink, and instead of keeping the fountain filled up we stopped.

(743) Q. During that run did you notice the condition of the ink in the fountain? A. Yes, I did. It still looked the same as after it had been adjusted in the beginning.

Q. Did you notice whether or not there was any drying of the ink on the roller? A. If there were drying I did not see it. The press ran, and if there was drying on the rollers that press would not run. Those rollers would powder it so that you would not get an impression from the color that dried.

Q. What was the condition of the ink on those folders, Exhibit F-1, as they came off the press? A. Of the folders?

Q. Yes. A. There was no ink on the folders.

Q. Well state whether or not the ink was dry or wet as they came off. A. Oh, it was dry as it came off the press; the paper was dry.

Q. Now I notice the signature "Roy Carroll" on that Exhibit F-1. Is that your name (indicating)? A. That is my signature.

Q. And you signed it on what day? A. November 18, 1942.

Q. There are other names on there——

The Court: What is that date, the date of the printing?

(744) The Witness: The date of the printing.

The Court: And what is that date again?

The Witness: November 18, 1942.

Q. There are some other names on that Exhibit F-1. Were those put on in your presence? A. They were.

Q. I show you an invoice dated November 18, 1942, from Sinclair & Carroll to W. F. Hall Printing Company, and I ask you what that is, if you know (handing to witness)? A. This receipt covers the heat-set printing ink which we supplied to Hall, and which were run on this job.

Mr. Free: I offer in evidence as Defendant's Exhibit A-2 the receipt identified by the witness.

Mr. Byerly: Your Honor, I object on the ground that it gives no information as to the composition of the inks.

The Court: As to what?

Mr. Byerly: The composition, what the inks were made of. It has symbols of one kind or another.

The Court: Well this proves that it was sold and used.

Mr. Free: This merely shows that certain inks were sent to Hall on that day. That is all it is intended for.

(Marked Defendant's Exhibit A-2.)

The Court: What is the date of that one?

Mr. Free: November 18, 1942.

(745) Q. Will you tell us, Mr. Carroll, whether or not this receipt, Defendant's Exhibit A-2, referred to the ink with which Defendant's Exhibit F-1 was printed? A. It refers to the inks.

Q. Do you have with you samples of those inks as actually used to print Exhibit F-1? A. I have (producing).

Q. You have produced four metal cans marked "Sinclair & Carroll Company, Inc.", dated 11/18/42, and I ask you whether those are the cans which contain the ink with which Exhibit F-1 was printed? A. They are.

Q. Will you tell us whether or not you saw these cans filled? A. I saw them filled.

Q. And what ink was put in these cans? A. The printing inks that were sent up to Hall's for printing this signature.

Mr. Free: Exhibit F-2. The witness referred to Defendant's Exhibit F-2.

The Court: F-2—both cans are the same?

Mr. Free: The four cans are the same, but he refers to the printing of this circular.

Mr. Byerly: Isn't it Exhibit F-1?

Mr. Free: Yes, F-1, I should say. I mark these four cans for identification, the first can as Defend-

ant's Exhibit B-2, marked "Rotary Yellow, 1st Down, No. 20805."

(746) (Marked Defendant's Exhibit B-2 for identification.)

Mr. Free: The second can marked "Rotary Red, Second Down, No. 20806", as Defendant's Exhibit C-2 for identification.

(Marked Defendant's Exhibit C-2 for identification.)

Mr. Free: As Defendant's Exhibit D-2 for identification the can marked "Rotary Black, Third Down, No. 20807."

(Marked Defendant's Exhibit D-2 for identification.)

Mr. Free: And as Defendant's Exhibit E-2 for identification the can marked "Rotary Blue, 4th Down, No. 20808."

(Marked Defendant's Exhibit E-2 for identification.)

Q. Now just to connect them up, Mr. Carroll, tell us whether or not these four cans have been in your presence ever since you put the ink in them? A. They were, up until the time I left Chicago.

Q. Now I show you five formula cards entitled "Production Order", four of them being dated 11/5/42 and the fifth dated 11/3/42, and I ask you what they are if you know (handing to witness)?. A. They are the formulas (747) for the printing ink as printed on Exhibit F-1.

Q. And as contained in these four cans? A. And as contained in those four cans.

Q. Tell us whether or not the ink in these four cans and shown on those cards was made up in your presence? A. It was.

Q. And these cards are from your files? A. They are from our files.

Mr. Free: I offer in evidence as Defendant's Exhibit F-2 the card dated 11/3/42 entitled "Heat-Set Varnish No. 20798."

(Marked Defendant's Exhibit F-2.)

Mr. Free: And as Defendant's Exhibit G-2 the formula card dated 11/5/42 and marked "Rotary Yellow, 1st Down, No. 20805."

(Marked Defendant's Exhibit G-2.)

Mr. Free: And as Defendant's Exhibit H-2 the formula card marked "Rotary Red, 2nd Down, No. 20806", dated 11/5/42.

(Marked Defendant's Exhibit H-2.)

Mr. Free: As Defendant's Exhibit I-2 the formula card dated 11/5/42, marked "Rotary Blue, 4th Down, No. 20808."

(Marked Defendant's Exhibit I-2.)

Mr. Free: And as Defendant's Exhibit J-2 the formula card dated 11/5/42 marked "Rotary Black, 3rd Down, (748) No. 20807."

(Marked Defendant's Exhibit J-2.)

Q. I notice that in four of these cans for the four-color inks each refers to No. C20798 varnish. What is that? A. That is the heat-set varnish made according to the McElroy patent.

Q. Do you have a formula for that also? A. Yes, I have.

The Court: Is that a varnish?

Mr. Free: Yes, your Honor.

Q. And what is that formula? What card is it on? A. This is on one of our standard production orders.

Mr. Free: The witness refers to the card, Exhibit F-2.

Q. Now, Mr. Carroll, I wish you would open one of these cans—take Defendant's Exhibit E-2 for example—and show the Court the ink which is in it. A. I would like to, but I believe there is an opener on your desk.

Q. Here it is (handing witness). A. (The witness opens can and demonstrates to the Court.) It is very gooey stuff, more like heavy molasses.

Q. And was that particular ink, Defendant's Exhibit F-2, used without change on the press when Defendant's Exhibit F-1 was run—the folder? A. F-1—what are you referring to, exhibit numbers?

Q. This circular. A. This ink was used on this (749) circular.

Q. Without change?

The Court: As they came out of the cans?

The Witness: Well I had to add a little more solvent, to adjust it to the press.

The Court: That thins it a little?

The Witness: That thins it a little.

Q. You made it thick first? A. I made it thick in the beginning because we always, before we start a job, make it as heavy as the paper could stand. I had a fair idea of what it could stand, so I made it heavy at first and softened it down after it ran on the press. It ran a couple of hours that way.

Q. What was the thinner you put in the fountains? A. Terpineol.

Q. And you brought a can of that with you? A. I brought a can of that with me.

The Court: Is that a solvent?

Mr. Free: That is one of the McElroy solvents, your Honor.

Q. When you thin an ink in the fountain how do you go about it? A. I take an ink knife, a long ink knife, take the can of solvent and pour it in, just so much, and watch the consistency as I pour it in so that it (750) gets nice and free-flowing.

Q. Do you measure the solvent that you put in or do you put in just enough to get the right consistency? Which is which? A. We should measure—we have an idea of what we are putting into it, of course. We take a container, as a rule, like an open can, either fill it or half fill it, and pour it in.

Q. Do you have any idea how much of that solvent terpineol you put in these ink fountains after that? A. Yes. I should say it ran between one and one-half per cent on the yellow and perhaps about three-quarters of one per cent to one per cent on the red, blue and black.

Q. How much terpineol did you have with you? A. About eight pounds.

Q. How much of it did you use in these inks? A. I used most all the eight pounds.

Q. Now I would like to show you a Montgomery-Ward Christmas book of 1942 and ask you whether you ever saw any part of it before (handing to witness)? A. Yes, sir. I have seen this part here (indicating).

Q. What pages are you referring to? A. Well, the pages vary according to the different signatures. This signature is different from our exhibit here because it was made for a different private mail order house.

(751) Mr. Free: The witness refers to Defendant's Exhibit F-1.

A. (Continuing) It is this hobby horse here—and the toys (indicating).

Q. Tell us whether or not you saw that one printed, the one I have given you (handing to witness)? A. I saw this job printed a couple of weeks before we sent our inks in on the test, on our exhibit here.

Q. Do you know whether or not this catalog page you have just referred to was run with this same ink shown in Defendant's Exhibit F-1? A. This is a different ink from our exhibit. I don't know whose ink this is. The Hall Company would know. It was their standard, whatever it is.

The Court: In other words, that Christmas catalog—what exhibit number is that?

Mr. Free: I was about to offer it. This Exhibit was not run with McElroy, and I will offer this one.

The Court: You did not supply the ink for that?

The Witness: I did not.

Mr. Free: I will have this marked KK for identification, with particular reference to page 59.

(Marked Defendant's Exhibit KK for identification.)

(752) Mr. Free: These four cans of ink which were heretofore marked for identification as Defendant's Exhibits B-2, C-2, D-2 and E-2 I will offer in evidence at this time, with the same letters that they now bear.

(Defendant's Exhibits B-2, C-2, D-2 and E-2 for identification received in evidence.)

Q. Still referring to these inks, Defendant's Exhibits B-2, C-2, D-2 and E-2, that is, the cans, would you from your experience call that a modern heat-set ink? A. I would call it a heat-set ink.

Q. How does it compare— A. Fairly modern.

Q. How does it compare with the inks you have made more recently and sold? A. Oh, of course——

The Court: You are asking him what?

Mr. Free: To compare this old ink made up for Montgomery-Ward with the new inks.

A. I think the newer inks—we know what they are and know how they have been running. They run very well, and this (indicating) runs somewhat similar to them but not as good.

Q. That is, you have— A. We have made improvements on them.

Q. What improvements? Are those in the nature of additions to the ink? A. Well, I would call them additions to the ink, yes.

(753) Q. What, for example? A. Well, to make a better heat-set ink than contained in the McElroy patent, why I would possibly use one of the hydrocarbon solvents that we use today in preference to terpineol.

Q. Do you know whether that is cheaper or more expensive than terpineol? A. It is much cheaper than terpineol. Terpineol is very expensive.

Q. What do these modern inks contain in addition to different solvents? A. Plasticizers.

Q. And what would that be? A. Well, I would call it the vegetable——

The Court: What do you use instead of terpineol, a cheaper what?

The Witness: A hydrocarbon or kerosene oil class.

The Court: Would you say a hydrocarbon solvent?

The Witness: I would.

Mr. Free: Yes. It is this Magie high boiling kerosene compound.

Q. I notice in your answers to the interrogatories you mentioned that the accused inks contain wax and grease,

for example. What do they do? A. That increases their stability. It helps them to remain open on the press. There is a lot of friction with that roller turning over so quickly, and that increases the stability (754) of the ink.

Q. I also notice in the answers to these interrogatories that you mention that the accused inks contain perilla oil, linseed oil. What do they do? A. Well, I had to melt the resin in something. I could not melt it in the solvent because that would evaporate, so that is why we have what we call a plasticizer. We melt the resin in there and cold-cut it with the hydrocarbon oil.

Q. By "cold-cut it" you mean you take it when it is cool— A. Take it off the fire and add a solvent.

Q. Tell us whether or not you use driers in the more modern heat-set inks?

The Court: Use what?

Mr. Free: Driers, your Honor.

A. Sometimes it is necessary but not all of them have a drier.

Q. Now after you began making these heat-set inks did you have any information as to what vapor pressure the solvents had? A. It was a mystery to me what vapor pressure was until I studied hard. In coming down to New York for the first time I really got it clear in my head what vapor pressure was. We never bought things by vapor pressure.

Q. When did you first find out, if you ever did, what the vapor pressure of this 502-C oil is that you (755) use in your inks? A. Only recently.

Q. How did you go about finding that out?

The Court: He did not testify anything about using 502-C oil.

Mr. Free: I believe it is agreed that these accused inks contain 502-C oil. That is shown in the invoice in evidence.

The Court: Is that what he means by the kerosene that was used?

Mr. Free: Yes.

The Court: The 502-C oil?

Mr. Free: Yes, your Honor, the 502-C oil.

Q. How did you find out what the vapor pressure of this 502-C oil is? A. I called up the company that supplied it and asked them what it was.

Q. Is that Magie? A. That was the Magie Company.

Q. How long ago was that? A. Not very long. It was about—oh, some time in December, about the first week or second week in December. Maybe it was November—I forget—November or December.

Q. Of what year? A. Of 1942.

Q. So that as we have it now you did not know anything about the vapor pressure of the oil used in the accused inks until December 1942? A. Absolutely no.

Q. Mr. Carroll, I want to ask you whether from (756) your experience this can of blue ink, Defendant's Exhibit E-2, which you have opened, is still in pretty good condition? A. Very good condition.

Q. I wonder if you would demonstrate to the Court how the ink is evaporated by heat. A. I could if I had a little sheet of paper and could make a draw-down on it.

Q. Will you please do so? A. Have you the little knife there on the table?

Q. Yes (handing to witness). A. (Demonstrating.)

Q. Will you please describe what you are doing? A. I am making a draw-down which will show the color.

The Court: Tell us what you have done: "I have taken some of the 502-C"——

The Witness: I have taken some of the 502-C——

Q. No. A. —or rather ink. The ink is ground in this. It has a number, 20808.

Q. Let us call it Exhibit E-2. A. E-2.

Q. And you are placing it on a piece of paper? A. Yes.

Mr. Freed: I will mark that paper Defendant's Exhibit LLL for identification.

(Marked Defendant's Exhibit LLL for identification.)

Q. Describe what you are doing. Now you are taking a knife, are you? A. I am taking a knife and I am going to make a pull-down so that we can distribute that color (757) into a small film. Now, I would like to pass this over a heater. It has to be hot.

Q. Wait until the heater has a little heat there. You are now doing what? A. I am now passing the draw-down of the ink over the heater.

Q. I notice smoke coming off of the paper, what is that? A. That is the 502 oil coming out of the solvent.

Q. You keep calling it 502 oil; is that what you mean? A. That is the heat-set blue.

Q. The solvent? A. Or solvent.

Q. What is the solvent? A. The solvent happens to be the 502-C oil.

The Court: It is the solvent that passes off as a smoke?

The Witness: Yes, your Honor.

Q. I asked you what the solvent is in the ink which was taken from Exhibit E-2. A. 502-C—oh, wait a minute, I am confused. I beg your pardon, this is the terpineol solvent and this is part of the exhibit. I was confused on that. No, that is the terpineol.

Q. Will you show us whether or not the ink on Exhibit LLL for identification, which I now offer in evidence, is dry or not? A. This is dry. Passing your finger over it you cannot rub it off. That is set.

The Court: That was not the ink you intended (758) to use for this experiment?

The Witness: This is the ink. This is the terpineol solvent ink. I was confused when I referred to the 502 then.

The Court: That is the butyl?

Mr. Free: No, this is the McElroy patent ink.

Q. I notice that paper, Exhibit LLL, is a little charred. A. That is from the heat. You have not enough distributed heat there. In passing it through a printing press it goes very fast and it will dry much better on the printing press than it will from this simple little operation. This is the nearest approach to it. The heat is not uniformly concentrated on that.

Q. Does that charring make any difference in the drying qualities of the ink? A. It would make it dry better.

Q. That is, the hotter the ink the better it dries? A. That is correct.

The Court: But you cannot use a heater that chars the paper, can you, in actual practice?

The Witness: You cannot use a heater that chars the paper, but the paper has to run through so fast that it won't char it.

The Court: But if it does char it, the heat is no good?

The Witness: If it does char and you cannot (759) get any better results than that, then it would be no good.

The Court: It would not be a successful operation if the paper came out charred?

The Witness: No, sir, it would not.

Q. I do not want to ask you to demonstrate the heat-drying properties of these other inks in Exhibits B-2, C-2 and D-2, but can you tell us whether or not they would act the same? A. They would.

Q. Now, I show you a container, marked Sinclair & Carroll Company, Inc., Defendant's Exhibit V, and ask you

what that is, if you know? A. That is our solvent for the heat-set inks we are running today, or have run in the past.

Q. That contains what? A. Just the hydrocarbons or kerosene fractions.

Q. Called what? A. Called 502-C oil.

Q. Tell us whether or not you sent a container like that to Mr. Clinton Taylor in Cincinnati? A. I did.

The Court: Did you follow this McElroy patent in making up your ink purposely?

The Witness: Purposely I adhered to the three ingredients that were in it.

The Court: Why, did you have a license under that patent?

(760) The Witness: No, sir.

Mr. Free: That patent had expired, your Honor. It was public property.

The Court: But you just looked up that patent and follow it in making up your ink?

The Witness: Yes, but there were corrections on the press where we had the extra solvent, and in the beginning we adjusted the amounts to make suitable consistencies.

Cross examination by Mr. Byerly:

Q. It was in 1938 you made your first heat-set ink? A. Yes.

Q. And you yourself had been in the ink business since around 1913, is that right? A. Yes, that is correct.

Q. And when you were making linseed oil inks, which you have done a good part of your life if I understand you correctly, will you tell us how you adjust the thickness or consistency of a linseed oil ink? A. We would, if it was too heavy, we would cut it with a reducer, or we might extend it with more soft linseed varnish.

The Court: What is the difference between reducing it and extending it?

The Witness: Reducing it you take a very (761) quick cut like kerosene. You would not use as much, very little, and that thins it down.

Q. But you have linseed varnish of a number of different viscosities or thickness, don't you? A. True.

Q. And you mix a different amount of one varnish or another together to make an ink or put the body you want in? A. Sometimes.

Q. That is the ordinary way of making up a linseed oil ink? A. No two manufacturers make it the same way.

Q. That is, some mix in more of one and some more of another? A. That is right.

Q. Did you furnish the Hall Company with this heater they had on a press in 1938? A. No.

Q. That was already there before you started to make a heat-dried ink? A. I don't know.

Q. Well, you knew they had been using heat-dried inks before they asked you for one? A. They had just put in the heater before I walked in the plant and asked for an opportunity to sell ink on it. That is how I came to ask for the chance.

Q. Of course, the Vaporin heat-set inks were on the market at that time, were they not? A. What inks?

Q. Vaporin. A. I suppose so.

Q. You kept some track of what your competitors were selling, I suppose? A. Not too close a track.

(762) Q. Did you ever see an ink that would set instantly by heat and stay open on the rolls of a typographic press, before 1932? A. I do not know, I cannot remember.

Q. Do you remember when you first saw such an ink working on a typographic press, that is, an ink which stayed open on the rolls and dried instantly by heat? A. My ink was the ink I saw.

Q. You had never seen any ink that worked like that until you made up one, is that right? A. As far as I can remember that was the first I saw the heater. It was in an experimental stage at the Hall plant at the time.

Q. You had never seen any heat-set inks that were being put out by other ink companies before that? A. No.

Q. When you came to make an ink to work in this heater, if I understood you correctly, the first solvent you used, which was one you had in your plant, did not produce a very good ink, is that right? A. No, that is not right. It did not produce an ink good enough for some sheets of paper I had in mind.

Q. Then you called in the Magie Company to try and get a better solvent? A. He was one of the companies that called at the door all the time, and I asked him to put in a sample.

(763) Q. And when he gave you a sample you used that as a solvent in your ink and the ink worked better? A. It helped it a lot.

Q. Do you know whether the Hall Company bought all of their heat-set inks that they used from you? A. They do not.

Q. Who do they get them from? A. I don't know.

Q. Do you know whether they make any themselves? A. I have heard that they did.

Q. You have heard that they make their own heat-set inks? A. And I have also heard that they buy heat-set inks that are not ours.

Q. Now, these sample inks you made up and tried at Hall's were made for the purpose of getting evidence for defending this suit, were they not? A. I suppose so.

Q. Well; you knew that perfectly well, didn't you? A. Yes.

Q. Hall knew it too? A. I do not know anything about Hall.

Q. Hall did not charge you anything for trying these inks, did they? A. I cannot remember whether we received an invoice yet or not.

Q. Did they pay you for these inks? A. I did not bill them for them.

Q. What was this invoice you put in evidence? A. That (764) was the receipt.

Q. That was not a bill? A. No, that shows the ink was received.

Q. But the ink was billed, as I understand it? A. No.

Q. Was it you personally that formulated this varnish referred to on Exhibit J-2? A. You mean did I write that production order out?

Q. That is right. A. No, I had my foreman write it out.

Q. Apart from who wrote it out, who formulated it, who decided how much of these different things to put in? A. I had received a copy of part of the McElroy patent from Mr. Taylor, and he gave me the amounts according to the patent, and I had to vary those to make a printing ink that would run successfully at the present-day speeds. I adhere strictly to the three ingredients in the formula.

Q. But you changed the proportions very widely, didn't you? A. I changed the proportions.

Q. For instance, you remember finding in the McElroy patent Cumar P-25? A. I cannot remember the patent, whether it had a number or not. I do not think it had a number.

Q. Are there more than one Cumar resins? A. I have found that out, yes.

Q. How did you find that out? A. Because they had (765) a prospectus with several on it.

Q. Who did? A. The company from whom we bought the Cumar.

Q. Who was that? A. Oh, it is a well known company. I do not remember whether it was Barrett or not. It might be Barrett. I cannot remember now.

Q. You are not sure who it was? A. I cannot remember now.

Q. And you got the prospectus that this company put out in 1942, I suppose? A. I do not know when it was put out. I do not know whether I have the prospectus yet. I

think we destroyed it, because we figured that the present product we were supplying was all right. We had standards.

Q. You used the current prospectus of Cumar resins when you made up this ink? A. I do not know whether it was current or antique. I asked them for samples of their different resins. I did not see the prospectus when I ordered it.

Q. You just asked them for samples of all of them? A. No, the couple we needed.

Q. Why did you decide on those two? A. Because we wanted different melting point resins. Some were harder than others, some were softer.

Q. And you picked out two you thought you would (766) like on the prospectus, which you later destroyed? A. I did not destroy anything. I just don't remember it being around. I cannot produce it for you now, that is what I mean.

Q. Then you picked several Cumar resins from this prospectus and asked them to send you samples? A. I did not pick a couple.

Q. P-25 I suppose is one of those you picked? A. I liked that one better.

Q. And you cannot remember the name of the companies from whom you got that? A. I guess there is only one company that sells it as Cumar resin. I think that is a trademark name.

Q. Yes, but you personally do not remember the name of that company? A. I think it is Barrett.

Q. Looking at the second item on this formula card, F-2, it is pale second run rosin-oil, isn't it? A. That is correct.

Q. Did you find any mention in the McElroy of pale second run rosin-oil? A. Rosin-oil.

Q. Rosin-oil is all you found in the patent? A. That is true.

Q. What led you to pick pale second run rosin-oil? A. We happened to have always used it.

Q. There are several other kinds of rosin-oils, (767) are there? A. I suppose so. We just are limited in the number we use.

Q. Where did you get this pale second run rosin-oil? A. We had it in our inventory.

Q. You do not remember where you got it from? A. No; I don't. That I do not remember.

Q. Where did you get the terpineol? A. It was either duPont or a subsidiary of duPont's.

Q. You used considerably more pale second run rosin-oil than you did terpineol in this varnish, did you not? A. That is true.

Q. You say you saw a copy of the McElroy patent when you made this up? A. No, I did not. I had, oh, a formula sent to me by Mr. Taylor, who said it came from the McElroy patent, and he asked me to make it up that way.

Q. He did not send you a copy of the patent? A. I did not see the patent.

Q. Well now, the patent, that is, the McElroy patent, contains the following statement:

> "As an example of the preferred proportions of the ingredients named, we take by weight 95 per cent terpineol and 5 per cent rosin-oil, and stir until thoroughly mixed."

The Court: What are you reading from, Mr. (768) Byerly?

Mr. Byerly: From the McElroy patent, forming part of Defendant's Exhibit G, page 2, lines 16 to 19.

(Mr. Free hands copy of patent to witness.)

Mr. Byerly: Your Honor, I do not think it is necessary to furnish the witness with a copy of this patent. He has never seen it.

Mr. Free: If you are reading from it I would like to have the witness read with you.

The Court: All right.

Q. That is what the patent says that was handed you, 95 per cent terpineol to 5 per cent of rosin-oil? A. Yes.

Q. On the same percentage basis. When the rosin-oil plus the terpineol were 100 per cent, what was the percentage of terpineol and what was the percentage of pale second run rosin-oil used in the formula given on Exhibit F-2? A. 2 parts of rosin-oil and 1 part of terpineol.

Q. If you put it on the basis of a hundred that would be, say, 66 parts of rosin-oil and 33 parts of terpineol? A. It would amount to the same thing.

Q. Yes, as compared with 95 per cent of terpineol and 5 per cent of rosin-oil in the patent? A. Yes.

Q. The patent says, beginning at line 20 on page 2:

(769) "With 84 per cent of this mixture"—referring to the mixture of rosin-oil and terpineol—"we incorporate 16 per cent of powdered coumarone resin, that is, that known under the tradename Cumar."

What proportion of Cumar P-25 did you incorporate with the rosin-oil and terpineol? A. In this formula it has 176 pounds.

Q. 176 pounds of Cumar? A. Cumar.

Q. How much of the liquids? A. 88 pounds of rosin-oil and 44 pounds of the terpineol.

Q. That makes the Cumar amount to considerably more than half of the varnish, doesn't it? A. A little more.

Q. Whereas in McElroy it is stated that there should be 16 per cent of the powdered coumarone resin and 84 per cent of the terpineol and rosin-oil, is it not? A. Yes.

Q. Do you know why "varnish" is written twice on card J-2 and one number scratched out? A. Because he copied it wrong in the beginning and scratched it out to make it legible.

Q. What was he copying from? A. The varnish formula, which has a number.

Q. You mean he made a mistake in copying from Exhibit F-2? A. The number of the varnish used is (770) C-20798. He had it there and crossed it out to make it perfectly legible.

Q. Looking at your ink formula, J-2, what does that ink contain according to that formula, besides varnish? A. Carbon black and reflux blue.

Q. Is that reflux blue a pigment? A. No, it happens to be a pulp ink flushed in an ordinary oil, linseed varnish. That is a class of toner used in the printing business.

Q. Just tell us what you mean by a flush color? A. We buy it as an ink already made. The firm that sells us this pulp blue does not put it through a drier and extract the moisture. They just leave the powder behind. In the process they substitute linseed varnish or any other varnish they want to, and dry out the water through means of a vacuum or heat, and we buy it in that condition.

Q. Then what you buy is a pigment already dispersed in linseed oil, is that right? A. In this case.

Q. What is the consistency of that flush color, about like a printing ink when you get it? A. It is heavy consistency. It has to be cut down before it can be used.

Q. Then when you added this so-called reflux blue referred to on Exhibit J-2, you added some linseed oil (771) varnish to the ink you were making at the same time you added pigment, did you not? A. A very small amount.

Q. What percentage of this reflux blue is linseed oil, do you know? A. I have no direct knowledge.

Q. What does this symbol 1577 mean? A. That is the identifying number that our supplier puts on it when he sells it to us.

Q. Who did you get this reflux blue from? A. The Standard Ultramarine Company.

Q. How would you use this reflux blue if you were making an old-fashioned oil ink out of it? A. That particular type of blue we very rarely run concentrated. We use that in small amounts as a toner, principally in black inks to give it more depth.

Q. You could make an ink out of it by merely adding some thin linseed oil varnish to it, couldn't you? A. I never tried it.

Q. And you have no idea what percentage of linseed oil it contains? A. No, I don't.

Q. Looking at your formula card, H-2, according to the formula what did that ink contain besides the varnish? A. It has some magnesia and two different red pigments.

(Short recess.)

Q. As I understand it, you made up these inks, referred to on these formula cards, after receiving some (772) kind of instructions or information from the Hilton-Davis Company? A. From Mr. Taylor, who was there.

Q. Were those in writing? A. He had them in a memorandum.

Q. I mean did he give you a memorandum? A. He had a memorandum, yes, that he gave me.

Q. Can you produce that? A. I cannot, I have not it with me.

Q. What did you do with that? A. I suppose that is in the files somewhere.

Q. I see, but you did not bring that in? A. No, I did not.

Q. You do not remember just what it said? A. It just said this is the formula taken from the McElroy patent.

Q. And you do not remember just what the formula was? A. The formula was the same as in the McElroy patent.

Q. You mean it said 95 per cent terpineol and 5 per cent of rosin-oil? A. If that is what is in the patent, it did.

Q. Did it contain any suggestions as to how you should modify that? A. Yes, it said you could modify it to suit your conditions.

Q. It did? A. I believe it did, from my memory.

Q. How long did this printing trial take at Hall's? (773) A. Oh, a couple of hours.

Q. How many times was the press shut down during that couple of hours? A. I do not remember it shutting down once. It ran right ahead.

Q. Then this terpineol you added to the fountains, did you do that while the press was running? A. Not the very beginning. Before we really got started I did that.

Q. But while the press was running? A. Not while the press was running.

Q. Oh, not while the press was running? A. No, you could not do it that way.

Q. What did you do, run the press a little while and then decided you needed a little more terpineol added? A. Just started the web through the press. Then I decided to adjust it so that the inks would not pick the paper coating.

Q. They would not pick the paper coating unless they got pretty thick on the ink rolls? A. When you start a press in the morning and it is cold, any ink will do that.

Q. Then did you add this terpineol to all three of the inks? A. All four of the inks right on down the line, so as to keep my consistency the same.

Q. These samples you have got, are those samples you (774) took out of the fountain at the end of the run? A. I took those out of the ink before it was delivered to the W. F. Hall plant.

Q. You did not keep any samples of what was left in the fountains? A. No, I did not.

Q. There was some left in the fountain? A. Naturally.

Q. That was just thrown away, as far as you know? A. That is true.

Q. You did not use it all up? A. No, you have to keep the fountain fairly full in order to print, to force it down to fit.

Q. Then you just took that out and threw it away? A. I had nothing to do with it.

Q. Do you know what kind of paper this was printed on? A. The same kind of paper stock I believe that the regular Christmas flier of Montgomery-Ward's is printed on.

Q. Was this the kind of paper you had supplied ink for before? A. Similar papers all the time.

Q. But, as I understand it, Hall had not been printing this catalog with your ink? A. No, they had not.

Q. And you do not know where they got the heat-set ink they were printing it from? A. No, I do not know where they got the ink they printed it with.

Q. When you got these instructions from Mr. Taylor you knew he was going to act as expert in this case, did (775) you not? A. I knew he was, yes.

Q. Were his services as expert contributed by the Hilton-Davis Company? A. I suppose so.

Q. You have not paid him anything? A. No.

Q. You have had other contributions towards your defense, haven't you? A. Yes.

Q. Any from the Half Company? A. No.

Q. But they ran this run without charging you? A. They may have a bill in yet, I don't know.

Q. But you know you have not paid them anything? A. That is true.

Q. Referring again to this McElroy patent and the notice on page 2 at line 21, there is a reference to powdered coumarone resin, you see that, don't you? A. Yes.

Q. Now, did you add this resin, referred to on your formula card as coumarone P-25, in the form of a powder? A. Well, it is very sticky, like a ball of very hard wax, giving with a little elasticity.

Q. Was it in the form of a powder? A. We tried the powder too, but we liked that better.

Q. You mean the powder was a different coumarone resin? A. No, it is the same kind of resin, only it is in a little different form.

Q. That is, this P-25 does not come in powdered form? (776) A. No, that is not powdered. That is more or less of a sticky, waxy substance.

Q. You referred to having a catalog of coumarone resins, I think you said it was from the Barrett Company you thought? A. Yes.

Q. I show you a so-called Cumar specification chart, forming part of the Cumar catalog of the Barrett Company, did you have that chart before you when you were picking out the resins? A. This looks like something I have seen; very similar to it.

Q. Now, on that chart there is a mention of P-25, and under the column "Formula", P-25 is referred to as viscous, is it not? A. That is correct.

Q. And this P-25 you got from the Barrett Company was viscous, wasn't it? A. As I have described it.

Q. You say you also tried some powdered coumarone resin? A. Yes.

Q. You did not like that as well? A. I thought the other would make a better printing ink from my ink maker's viewpoint.

Mr. Byerly: I ask the clerk to identify the chart shown to the witness.

(Marked Plaintiff's Exhibit 38 for identification.)

(777) *Re-direct examination by Mr. Free:*

Q. Mr. Carroll, you were asked some questions about consistency of inks, can you tell us whether the consistency of the four colors differs one from the other? A. Oh, yes, sir.

Q. Why? A. Because they have to trap. The first color laid down on the sheet has to have enough tack to pick up the next color.

Q. Is that the stickiest, the first color? A. The first color is the stickiest.

By the Court:

Q. One color is put on top of the other? A. One color is put on top of the other.

Q. In the same operation? A. In the same operation, in four-color printing.

Q. What is the first color you use? A. Generally yellow.

Q. The whole figure is yellow, and on top of that is another color you do not want yellow? A. On top of that you may want the red to give you the oranges. Then on top of that comes, say, the blue to give the navy blues and the violets, and the black may be run third down or fourth down, and that is put on for the detail, to bring out the more contrasts.

Q. Are those colors on standard rolls that follow each after each other?

(778) Mr. Free: Yes, sir.

(Discussion off the record.)

The Court: After the first cylinder is through then it is all blue or one color, and then on top of that it is modified by putting the other colors on top of that blue?

Mr. Free: Is that right?

The Witness: You first print yellow and you print red on it. You cannot see it because they are all closely together in the press, but if you took the sheet out after printing two colors you would find sort of an orange effect, and then after you printed yellow, red and blue you would find green, violet and navy blues.

The Court: According to what the ink was printed over, what was put on over?

The Witness: That is correct.

By Mr. Free:

Q. But these consistencies, Mr. Carroll, are varied? A. You have to vary.

Q. The first one down is stickier than the last one? A. The last is the softest and in between comes your two modified consistencies, the red a little softer than the yellow, and the blue a little softer than the red.

The Court: You say if you put a red on top of a (779) yellow you get orange?

The Witness: That is true.

The Court: Supposing you do not want orange?

The Witness: Then you do not have it in the color plate. They etch that out in the color plate and leave it clear.

The Court: Leave the paper free?

The Witness: Yes.

Q. How is the difference in the consistency between the different colors obtained? A. You have to use a little more resin in your varnish, as a rule, because that is because you take the heavy consistency, you certainly won't get the heavy consistency from a solvent.

Q. I want to ask you one more question. Have you ever used butyl carbitol in any of your commercial inks? A. I never sold any ink with butyl carbitol in it.

Q. You were asked about this second run rosin-oil; how long have you been using that in your business? A. Ever since we have been in business, for about, oh, 20 years.

Q. Now, these driers, I think it might be a little confusing as to what their function is in ink, what do they do? A. Well, in some cases driers are not necessary and in

other cases you may think they are necessary and put it in there thinking it is going to help the drying (780) condition.

Q. Something like the driers they put in ordinary paints? A. I do not know what they put in paints, but it probably has some relationship.

Q. You were asked about the amount of linseed oil and reflux blue referred to on Exhibit I-2; do you have any notation at all as to how much liquid of any kind is in that reflux blue? A. Oh, a very small amount, just enough to make an ink, possibly about half the amount of reflux blue in it.

Q. It is pretty thick, is it? A. Yes, it is very thick.

Mr. Free: I have here a notice to plaintiff to produce the original letter, which I will give to the clerk to file and a copy to Mr. Byerly. I am asking for a letter which I understand was written by the Carbide & Carbon Chemicals Corporation dated February 8, 1928 to Cray-Finne, mentioning butyl carbitol. Cray & Finne, as you remember, were bought out by the plaintiff here, and this letter ought to be in the old files of Cray & Finne.

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(781) Raymond A. Kerley, called as a witness on behalf of the defendant, being duly sworn, testified as follows:

Direct examination by Mr. Free:

Q. Where do you live and what is your occupation, Mr. Kerley? A. 807 South Clarence Avenue.

Q. That is Chicago, is it? A. Oak Park, Illinois.

Q. And what is your occupation? A. I am a printing ink maker.

Q. With whom? A. W. F. Hall Printing Company.

Q. That is Chicago? A. Chicago, Illinois.

Q. Do you know anything about the printing business? A. A little bit.

Q. Have you ever been a printer? A. Yes.

Q. Tell us something about your experience in printing. How long have you done that kind of work? A. Well, I have been doing printing ever since I was 13 years old. That started around 1910, in various plants, some in New York State, but mostly in Chicago. I have been with various plants like Manz Engraving Company, the American Colortype Company—those are all Chicago houses—and Cuneo Corporation.

Q. Cuneo is one of the largest printers in the country, isn't it? A. That is right.

Q. How long have you been with Hall? A. Five years.

(782) Q. How large is Hall? A. They are one of the largest.

Q. What sort of printing does Hall do? A. A general line of magazine, mail order and a general line of commercial printing.

Q. Do typographic, rotogravure and so on? A. Well, W. F. Hall does typographic only. The subsidiary Rotoprint does the gravure—Chicago Rotoprint.

Q. And how far apart are those plants? A. Four blocks.

Q. Do you have occasion to go from one plant to the other? A. Occasionally.

Q. You spend most of your time in which plant? A. W. F. Hall.

Q. That is the typographic plant? A. Right.

Q. Have you ever had any of these heat-set inks in your plant? A. Yes.

Q. Where did you get them from? A. I make most of them.

Q. Have you purchased them from any other sources? A. Yes.

Q. Name those, please. A. Why, we purchase from houses like Sigmund & Ullman Company, Sinclair & Carroll Company, the American Printing Ink Company and the

International Printing Ink Company. That covers the field pretty well so far as large operators are concerned.

(783) Q. What sort of presses are those inks used on? A. Why, they are used on the Goss type and the Cottrell—well, they are mostly Goss presses. We have a few Scott presses. That would cover the press angle pretty well.

Q. Great big things such as shown on Plaintiff's Exhibit 14, are they not (indicating)? A. That is right.

Q. Is that in general what they are? A. That is the general setup.

Q. The web comes out and is printed? A. Yes.

The Court: What makes that web go through? Is it pulled from the far end?

The Witness: The press pulls them through the impression cylinders, the plates that are pressing against what we call the backing cylinder where it gets the impression. Then it is also helped pulled through by the folder at the extreme end.

The Court: At the extreme end?

The Witness: Yes.

Q. It is like being pulled through a clothes wringer? A. Yes, a similar thing.

The Court: It is pulled from the far end or the beginning?

The Witness: At the beginning.

(784) The Court: In the beginning it is pushed in?

The Witness: Well, it is pulled in.

The Court: How many of those rollers are in the machinery? How many of them really make the press turn?

The Witness: All of them. They are all different cylinders, all geared in.

The Court: All geared in?

The Witness: Yes.

Q. There is a great big gear box at the end and they are all connected? A. That is right. They are all gear-driven.

Q. On all these heat-set presses the ink is applied to the paper, as I understand it? A. That is right.

Q. And then it is dried by heat? A. That is right, high pressure heaters.

Q. What happens to the ink when you dry by heat? A. Well, it volatilizes off going through this high pressure heating and becomes dry.

Q. You suck off the vapors? A. That is right.

Q. And then it passes over a cooling cylinder? A. Yes.

Q. What does that do? A. They merely cool the sheet down to prevent the succeeding impressions from becoming hot. In other words, the sheet has to be (785) cooled so that the succeeding colors are not affected by heating up the plate cylinders and breaking down the viscosities of the various inks.

Q. When did you first begin using heat-set inks that you said you bought from International Printing Ink Corporation? A. Well, I would say in the last two years we were able to successfully run some of their types.

Q. Were you able to successfully run their heat-set inks prior to that? A. Well, we have had that on—we have had trouble—in fact we have had trouble with the various companies.

Q. Were you ever able to make I.P.I. heat-set inks run prior to two years ago? A. Well, not so good, no.

Q. What happened? A. Well, there was quite a tendency to pile and perhaps the setting-up actions in the earlier stages prevented good trapping.

Q. You used the word "pile". We do not know what that means. A. Well, in other words, if an ink, as you explained here, had a tendency to volatilize too fast, the solvent would get out while that press was in motion at high speed, you would naturally lose your proper viscosity and pulling or carrying action of the vehicle.

(786) Q. Where would that evaporation take place? A. Well, on the rollers.

Q. And you found that to be the case with the I.P.I. ink? A. I found that to be the case with several of them.

Q. Including I.P.I.? A. Including I.P.I.

Q. What happened when the ink dried on the rollers in that way? A. Well, you could not print. I mean you could not print properly.

Q. What did you do in that instance? A. Well, we would have to get a hold of the people involved and try to get them to straighten themselves out through manipulations of whatever they thought was necessary.

Q. Did the I.P.I. ink man ever come in to manipulate it? A. Yes.

Q. What would he do? A. Oh, he would add various thinners or carrying vehicles.

Q. Do you remember any particular instance where that was done? A. Well, so far as date is concerned I would not be able to put my finger on the date, no.

Q. Do you know any instance at any date? A. Yes.

Q. Will you describe what happened? A. Well, they perhaps helped themselves to a great degree by bringing in a service man to manipulate the various colors to get the press running properly.

Q. Did they put a solvent in the fountain to thin (787) out the ink? A. Well, I would not know what they used. I was not interested.

The Court: As I understand it, it is only during the last few years that you have been able to use these inks satisfactorily?

The Witness: Yes, the last couple of years.

The Court: You have had trouble?

The Witness: Yes.

Mr. Free: That is I.P.I. inks, your Honor, the International Printing Ink, plaintiff's ink.

The Court: Is that the only one you have had trouble with?

The Witness: No, we have had trouble with other houses.

The Court: No distinction between the I.P.I. and the others?

The Witness: No.

Q. What is the first good heat-set ink that you saw or used? A. Well, I don't like to brag but I did a pretty good job myself.

Q. When was that? A. Why I started it, I think, around the latter part of 1937, and of course I had my troubles as well as everybody else has in getting them organized to manipulate properly. I would say in the last four years we have been quite successful with our own setup.

(788) The Court: You mean the ink you made yourself?

The Witness: That is right, your Honor.

Q. How about the Sinclair & Carroll Company ink? How did that ink work? A. Well, we had the same trouble, the same as mentioned with other houses, but he finally got straightened out like other people have.

Q. As I understand it, these webs, after the ink is applied, go through heaters? A. That is right.

Q. How hot are they? A. Well, we have measured to a degree as possible; they go from the tip of the flame, from 1700 to 1900 degrees of heat, but on the traveling web I would say they don't take over 350 to 400 degrees of heat.

Q. How close is the web to the gas flame? A. About an inch.

Q. It passes down right in front of the gas flame? A. That is right.

Q. They are arranged in a sort of a bank, aren't they, the gas flames? A. Well, depending on the construction of

the machinery. It doesn't make any difference how they have that oven in there.

Q. Do you know whether or not the advent of a good oven had anything to do with the success of heat-set inks? A. I would say without an oven you could not run any of them.

(789) Q. When was the first good oven that you know about put into operation in your plant? A. About 1937. Previous to that—or rather around the same time I think on one of the big units we put in 32 gas burners of our own in our experimental work.

Q. That is, you took a standard press and put heaters on? A. That is right.

Q. And it wasn't until later that you got a successful heater? A. That is right, high pressure type.

Q. And that, you think, has largely to do with the success of these inks? A. Yes, I think so.

Q. Now I show you a Montgomery-Ward folder which is marked in evidence as Defendant's Exhibit F-1 and ask if you ever saw that before (handing to witness)? A. Yes, I am familiar with it.

Q. Can you tell us what you know about it? A. Well, we made a test run. I think the date is on here—11/18/42. This is my signature on here. Those inks were put in a run in the same manner as we would any other type of heat-set ink, and the difficulty of starting up was no more than any other type on a cold press. We have to dope all our inks on a cold press.

The Court: Do I understand that is changed when you get your press warmed up?

The Witness: Well, we generally do. Of course (790) this was a test run. With the little change Carroll made we were able to go ahead and run a couple of hours without getting back to the normal inks again.

Q. What change did he make? A. Well, he added some ingredients that he brought around.

Q. Was it a liquid or a solid? A. A liquid.

Q. Did he pour it out of a can? A. Yes.

Q. In each of the fountains? A. Yes.

Q. How many fountains were there? A. Eight.

Q. And after that did the press run all right with the inks? A. Yes, we ran a couple of hours.

Q. In the running of that two-hour run or test was there any difference between the operation of the ink in the fountain and your own heat-set inks? A. Not in the fountain, no.

Q. Was there any difference in the drying properties of the two-hour run test ink and your ink? A. They were dried with less heat, I would say.

Q. And this folder, Exhibit F-1, came out of the press in what condition? A. Very good, as you see it there.

Q. Perfectly dry? A. Yes.

Q. Would you look at the quality of the printing on Exhibit F-1 and let us have your opinion on it? A. Well, I would say it is a pretty fair job of printing. (791) However, it does not compare with the general run of our catalog.

Q. I show you the catalog, Defendant's Exhibit KK for identification, particularly page 59 of it, and ask you to compare it with— A. 59—well, these pages run different. This is a different house. That is a South Side page—it would be 57 here.

Q. Well, compare 57 of Exhibit F-1 with page 56 of Exhibit DD. A. Well, this is the type of ink—in other words, this test of ink had a flatter appearance.

Q. You are referring to the folder, Exhibit F-1 now, is that right? A. That is right—than the original run.

Q. That is, a modern ink makes a little better job, is that it? A. Oh yes, it naturally would.

Q. What causes the difference in gloss between these two exhibits in the ink? A. Well, that is a little trick maybe of the ink maker, knowing how to manipulate his

formula with the various types of varnishes and ingredients used.

Q. Did you ever put wax or grease in your inks? A. Yes.

Q. What is that for? A. Why, it gives you a little stability, and I would say it helps lubrication on the rollers; help trapping occasionally where you have to cut back for softening down; instead of using a solvent to cut (792) with, cut with a grease.

Q. Does the grease have any effect on the evaporation rate of the solvent? A. Well, I think it does. I think it slows it down a little bit so far as the rollers are concerned. However, that same solvent in the ink would flash out with the burner.

Q. That is, the burner is hot enough to flash out— A. Yes, it will take it out regardless of the grease in there.

Q. The solvent is heated at such a temperature that it all goes out? A. Those heaters will take most anything out of an ink.

Q. I show you this Montgomery-Ward Christmas Catalog, Defendant's Exhibit KK, and ask you if you recognize it (handing to witness)? A. Yes, I am very familiar with it.

Q. Who printed it? A. Well, that is printed in different houses. I think the Cuneo Press printed a lot of that. We printed the heat-set pages in there, and there is some offset work in there.

Q. The heat-set pages are what? A. This section here.

Q. Like Exhibit F-1? A: That is right—page 57. Of course they are different in that book—pages 58, 59, 60, 61—then it goes over to page 97. That insert (793) is in here, you see (indicating).

Q. Yes. A. And from 97 on.

Q. That is comparable to what pages in Defendant's Exhibit KK? A. This one here (indicating).

Q. Page 59? A. 57 in here.

Q. Well, look at that one, one of the pages in that catalog. A. Page 59.

Q. 59 to this one—is that 62? A. That is 62—compares here with 60.

Mr. Free: Of Exhibit F-1.

Q. Now how about the other pages in this bound book? A. 60 and 61 compare with 58 and 59 on this exhibit here.

Mr. Free: Exhibit F-1.

Q. You recognize this whole catalog? A: Yes.

Q. Where did it come from? A. Well, I do not know where it came from, but it came out of our plant apparently.

Q. Your plant? A. Yes, sir.

Q. You know it to be your product? A. That is right.

Mr. Free: I offer it in evidence as Defendant's Exhibit KK, the Montgomery-Ward Catalog formerly marked for identification with that letter.

(Defendant's Exhibit KK for identification received in evidence.)

Q. Now you mentioned that there are other types of printing in this catalog. Will you glance through it and (794) tell me what they are (handing to witness)? A. Well, this signature spread here is offset printing.

Q. What pages? A. 80 and 81—wait a minute. I will take 79, 80 and 81, get them all—and 82.

The Court: Page 79—

The Witness: 79 to 82 inclusive.

The Court: Is what?

The Witness: Offset printing.

The Court: What do you mean by offset printing?

The Witness: Offset printing is done through the transfer from a plate to a rubber blanket and

the impression is taken from the rubber blanket rather than direct from the plate. That is where the term "offset" comes from.

Q. That is a different type of printing from the heat-set ink process? A. That is right. Those are regular linseed oil type inks generally speaking.

The Court: You have to wait for them to dry?
The Witness: That is right.
The Court: It holds up the whole thing?
The Witness: That is right.

Q. That is why it is printed in sections? A. Well, you mean as far as that catalog is concerned?

Q. Yes. A. Oh, sure, it would have to be. This job is printed from sheets, flat sheets; I mean the offset pages.

(795) Q. What other kind of printing is there in that? A. A lot of McKee process.

Q. What does that mean? A. Well, this is four-color process done on the McKee press. These pages here are McKee pages.

Q. Pages what? A. Oh, there are any number of them—43 to 46 inclusive.

Q. What is the McKee process? A. McKee process is a press that prints the four colors wet in one operation, and there is no means of drying other than drying by oxidation.

Q. What other methods of printing is shown in that book? A. Well, there is a lot of rotogravure in here. These pages are all rotogravure (indicating).

Q. What numbers? A. Pages 47 to 58 inclusive here.

Q. Describe that process for us. A. Well, that is a process done in quite a different manner. The plates are all—or rather the cylinder is one large unit. For instance, there may be 32 pages on one unit.

The Court: On one roll?

The Witness: On one roll, yes. It is all done from an etching process, and the process is below the level. Instead of printing from a raised surface you are printing from——

The Court. Rotogravure?

(796) The Witness: Rotogravure, yes. Those inks are applied in a liquid manner: A copper cylinder passing through the liquid ink and being scraped off with what we call a doctor blade. That leaves the high spot of the plate free and clear of ink whereas the etchings will take on the ink and deposit it on to a sheet of paper direct from a pressure roller.

Q. And then where does the web go after the ink is applied? A. The web then passes over some hot drums. Each color in this case is heated. Every single color is heated and dried before it passes on to the next color. In other words, you are not printing four colors wet, or whatever the case may be. Each color is generally dried singly.

Q. And what does the heat do to the ink? A. It flashes the volatile off in the same manner of the four-color heat process, very similar. In fact the process in my estimation—the four-color heat-set inks are more or less a glorified rotogravure ink.

Q. And what is the difference between them? A. Well, your four-color heat-set inks are higher in pigment and higher boiling range solvents.

Q. Why does the solvent have to have a higher boiling range? A. In heat-set?

Q. Yes. A. Because the rolls are all exposed to the (797) air. In four-color rotogravure they are in an enclosed fountain generally.

Q. That is because the exposed ink would dry out. It has a low boiling solvent? A. That is right. It would set. It would not be able to print.

Q. Now those rotogravure presses in your subsidiary plant have hoods that carry off the vapors? A. Oh, yes.

Q. Just like the heat-set presses? A. That is right.

Q. How about the speed? Do they run about as fast? A. Oh, I think they run faster.

Q. How old is the rotogravure process to your knowledge as you have just described it? A. Well, it goes back quite a ways. I would say 20 years perhaps—maybe a little longer. I am not so sure.

Q. Now I notice something in this catalog, Defendant's Exhibit KK, the page numbering and print are different. Can you account for that? A. Well, different houses—the only reason I can account for it is this. For instance, Chicago would have a different page setup as against Kansas City or some other house.

Q. But the type is set up the same way and printed all the same way for all houses? A. Well, generally. Prices may change in various parts of the country.

Q. I show you now some samples of printing on Defendant's Exhibit I for identification, or rather some (798) ink samples on paper, and I ask you what would you say about the quality of that ink (handing to witness)? A. Well, you have some covered up here. You could not tell much about it. That is glassine.

Q. That is cellophane? A. Cellophane. Well, these are fair. I wouldn't say too much about the cellophane printing. This one is all right (indicating).

Q. That is, those that are marked 1 and 2 are pretty good? A. Well, I would say they are pretty fair, yes. It is a rather raw, rather a crude method here (indicating).

Q. It is all right for 1888 ink? A. I wouldn't brag too much about it.

Q. It is all right for 1888 ink? A. I think so, yes.

Mr. Free: I think that is all, your Honor.

The Court: I suppose your cross examination will take quite some time?

Mr. Byerly: I think it will be at some length, yes.

The Court: Well, we will adjourn until two o'clock.

(Recess to 2:00 p. m.)

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(799) AFTERNOON SESSION.

RAYMOND A. KERLEY resumed the stand.

Cross examination by Mr. Byerly:

Q. Mr. Kerley, you saw this run of which Defendant's Exhibit F-1 was printed? A. Yes.

Q. How many copies were printed? A. Oh, I don't know. The job I think was four up, as we term it. There might have been eight or ten thousand copies.

Q. Do you know whether this one that was signed and put in evidence was taken near the beginning of the run or near the end? A. The end of the run.

Q. What was done with the other copies? A. We have them out there, I imagine.

Q. You did not use them in making up catalogs? A. No, we would not put them in the regular catalogs.

Q. They were not good enough? A. We would not. Is the regular catalog here? You have got it there, haven't you? (Hands catalog to counsel.)

Q. Has that the same page which is on the front of Exhibit F-1 in it? A. It is in there. However, it is a different folio. I think you will find it is 59. There you are.

Q. Now will you take Exhibit F-1. Will you see if you can rub the red off with your finger? A. This is (800) Exhibit F-1?

Q. Yes. A. (Witness makes test.) That is a pretty fair test.

Q. You did not press down very hard? A. No. We can probably do that on a good many different inks.

Q. Now can you do the same thing on the catalog? A. They are tighter.

Q. It does not smudge on the catalog the way it does on Exhibit F-1? A. That is right.

The Court: Which is Exhibit F-1 that smudged?

(Whereas it has been found that the document referred to as Exhibit F-1 in the cross examination of Raymond A. Kerley was a duplicate of Exhibit F-1 which had been furnished to plaintiff's counsel by defendant's counsel, it is hereby stipulated by and between counsel for plaintiff and defendant that said duplicate may be received in evidence as Plaintiff's Exhibit 67 with the same force and effect as though offered at the trial.)

Q. You know something about quality of printing, don't you? A. Yes.

Q. Have you ever seen a copy of a magazine called "Life"? A. Yes.

Q. What is it that you say about that as to quality? A. I would say that was a good quality commercial printed job.

Q. How does the quality of printing in "Life" compare with the quality of printing on the magazine called "True Romance"? A. "True Romance"; why, I would say it is a comparable job. It is a different sheet of paper.

Q. True Romance is one of the magazines printed by Hall's, isn't it? A. That is right.

Q. What sort of paper is it printed on? A. A super sheet.

(801) Q. What do you mean by that? A. What we call a supercalendar piece of paper, a high finish, and it is a hard sheet.

Q. You also print a magazine called "True Story"? A. That is right.

Q. What kind of paper is it printed on? A. That is the same thing.

Q. You print a magazine called "Parents"? A. That is right.

Q. What sort of paper is that printed on? A. Patent coated sheet.

Q. You print "Popular Photography"? A. That is right.

Q. Tell us some of the other magazines printed at Hall's? A. We have a hundred and one there. Well, Popular Photography, True Romance, True Story, Complete Photography, Parents——

Q. Those are the only ones you remember? A. There are a great number of smaller ones—Astrology. Those are the general run of heat-set magazines.

Q. There are some you do not use heat-set on? A. Yes.

Q. Which are those, for example? A. I should have brought some records along, I guess.

The Court: Who prints Life?

The Witness: R. R. Donnelley.

The Court: Where is it printed, in Chicago?

(802) The Witness: In Chicago. I think some in Philadelphia, the Eastern edition.

Q. Can you tell us any of the magazines you print without heat-set ink? A. There is an extension magazine runs without heat-set inks—Children's Activities. That is some of the magazines.

Q. But you say there are 101 altogether? A. I would rather have some records here so I would be more correct.

Q. What kind of paper are these magazines printed on that you do not use heat-set ink on? A. Some M. F. sheets, machine finished, and a coarser pulp stock on some of the papers.

Q. By "pulp stock" you mean a soft paper like newspaper? A. It is heavier than newspaper. It is a soft paper.

Q. It is heavier than newspaper, but just about as absorbent, isn't it? A. Pretty close to it. It is a harder sheet, however. Newsprint is about the softest thing we have.

Q. Hall prints a good many magazines on this pulp? A. Yes. We have what we call the pulp magazines.

Q. You print a lot of those? A. That is right.

Q. Those are the cheap magazines? A. Yes.

Q. Just when was it when you first came with Hall? A. 1937.

(803) Q. Do you remember in what time of the year? A. The first of the year.

Q. About the first of 1937? A. Yes.

Q. What had you been doing just before that? A. I had been with Hall on an experimental dryer about a year, I think all during 1936, something that I was getting out myself. It was a different process of drying than the type we have here now.

Q. That is something you were working on yourself? A. Yes.

Q. And Hall let you experiment there? A. That is right.

Q. That is something that did not ultimately develop? A. That is right. However, it developed in another stage through another company.

Q. Let us see, that was in 1936. What were you doing before that? A. Selling printing inks.

Q. For whom? A. Slight Metallic Inks Company.

Q. Where was that ink company located? A. Chicago.

Q. You were just a salesman for them? A. Salesman and service.

Q. And that was in 1935? A. Yes, that must have been in 1935 and back three or four years.

Q. That takes us back to about 1931 then? A. Right.

Q. What were you doing before that? A. I was in my own business, printing inks.

(804) Q. What was your business? A. Manufacture of printing inks.

Q. You were manufacturing printing inks on your own? A. That is right.

Q. About what period was that? A. About 1929 and 1930, I believe.

Q. How did that business come out? A. It did not.

Q. It failed, didn't it? A. It folded up.

Q. Were you making linseed oil inks then? A. That is right.

Q. What were you doing before you had your own business? A. Selling printing inks.

Q. Who for? A. A. R. Timberman Corporation.

Q. That was in Chicago? A. That was in Milwaukee, Milwaukee and Neenah and Menasha.

Q. You have said your experience in printing goes back to 1910; is that right? A. That is right.

Q. What kind of inks were they printing with when you started in in 1910? A. I believe they were linseed inks. I did not know much about the ink end of it those days.

Q. When did you begin to learn something about it? A. I think from then on.

Q. You started right in learning about it? A. That is right.

Q. You got pretty familiar with linseed oil inks? (805) A. Quite familiar.

Q. You knew how to mix them up and make them fit the work? A. That is right.

Q. You have spoken of a McKee four-color process? A. That is right.

Q. And in that case four colors were printed on each other while they were wet? A. That is right.

Q. What kind of inks were used in that process? A. We used a linseed and a gloss type printing inks, both types, or semi. It would be a combination of the two.

Q. How far back does this printing one color wet on top of another go? A. It goes quite a way. Speaking of two colors, two-color wet printing goes back 25 years.

Q. As long as that was done there was the problem of what you call trapping; making the two inks the right relative proportion and consistency? A. That is right.

Q. And that was worked out with linseed oil inks back in those days, I suppose? A. That is right.

Q. Did you sell any heat-set inks when you were in business for yourself? A. No.

Q. Did you know of anybody else who was selling them then? A. They were heat-set after a fashion, what we would call the flat bed quick setting ink. They would pass through an ordinary burner on a flat bed press.

Q. Those flat bed presses, they used to wait (806) somewhere for two hours up before they printed the other side? A. That is right; they would have to dry through oxidation.

Q. When you were in business for yourself did you come across any typographic inks that could be dried instantly by heat? A. Personally, no.

Q. When did you first see an ink that could be dried, saw it actually on a typographic press dried instantly by heat? A. About 1937.

Q. Where was that? A. W. F. Hall Printing Company.

Q. Was that an ink you made yourself? A. That is right. Wait a minute, just a minute now. 1937 we had inks in from the I. P. I. people at about the same time, I went into the manufacture of a similar type ink.

Q. That is, the I. P. I. inks were there at Hall's before you started to make that type of work? A. I would say that offhand. I have not got that record, but it is pretty closely tied together.

Q. The time you came there did Hall's already have heaters on their presses? A. No.

Q. Hall had had some of the I. P. I. quick-setting ink before they put in those heaters? A. Before the heaters?

Q. Yes. A. I don't think so.

Q. Would you know what inks Hall bought in 1936? (807) A. Meaning what?

Q. I am asking you a question. A. Before 1936?

Q. No, in 1936. A. I was not with Hall in 1936.

Q. Then you would not know what inks they bought? A. No.

Q. Do you know when they had these heaters installed? A. 1937.

Q. And when you joined them there in 1937 they had some I. P. I. quick-drying ink there, didn't they? A. Yes, I am pretty sure in 1937 we had some in there.

Q. Do you know how they came to install these heaters? A. No, I don't.

Q. If all they had was the kind of inks you were selling when you were in the ink business they would not have been likely to install these heaters, would they? A. I don't think they would.

Q. And they have been buying at least some of the I. P. I. heat-set inks most of the time you have been there; isn't that so? A. I think yes.

Q. First they bought the black and then they bought the colors? A. Yes.

Q. Is that right? A. That is right.

Q. And you were familiar with the I. P. I. inks before you set out to make yours, of course? A. Heat-set?

Q. Yes. A. Just from hearing about it; that is all (808) I can say.

Q. You saw some of it down in your plant? A. In our own plant in 1937.

Q. Yes, and you knew what it was made of? A. No.

Q. Well some of the Halls did? A. Knew what it was made of?

Q. Yes. A. I don't think so.

Q. You don't think so? A. If anybody would know I think I would know.

Q. Well when you set out to make your own inks, one thing you had to do—I mean when you set out there at Hall's to make a quick drying ink you had to have a solvent, didn't you? A. I wasn't sent in there to make quick drying inks. I am ahead of that.

Q. When you started there, after they got the I. P. I. quick drying inks and after you started to make some quick drying inks, didn't you? A. Yes, but ahead of that I was working on a drying arrangement myself, so I was quite familiar with what was going on in that respect in the drying of inks.

Q. What kind of inks were you trying to dry in your own arrangement? A. An ordinary ink.

Q. Ordinary linseed oil? A. Linseed type.

Q. What were you using, ozone or something? A. No.

Q. You had another way of drying linseed oil inks? (809) A. Yes.

Q. Were those inks which you made after the I. P. I. ink had come in there different from those that you were trying to dry on your own arrangement? A. The inks that I had made at the time? Yes.

Q. And when you set out to make these quick drying inks after the I. P. I. ink, that is after the I. P. I. ink arrived there, did you make them with linseed oil? A. No; a certain proportion, a small proportion.

Q. But you had to have some kind of a solvent, didn't you? A. That is right.

Q. Whom did you get that solvent from? A. I never got a solvent from anyone, not for the purpose of a heat-set vehicle. I bought the varnishes with the solvent in it.

Q. Oh, you bought them all made up with the varnishes and the solvent mixed together? A. That is right.

Q. Whom did you buy that from? A. Is it necessary that I answer that question?

The Court: I think so. There is no objection made by anybody.

Mr. Free: Is it something, Mr. Kerley, that has something to do with your private ink-making affairs?

The Witness: Well in a sense it has, yes.

Mr. Free: I think it is immaterial where he got them, your Honor.

(810) Mr. Byerly: It seems to me, your Honor, this man is taking a little credit for making this when he bought the varnish, which is the main part of the ink, ready made. We ought to know where it came from.

The Court: In order what came from?

Mr. Byerly: Where the varnishes came from.

The Court: What would it prove in this case?

Mr. Byerly: I think it would prove for one thing that this witness had nothing to do with originating these inks, that he simply bought them all except the pigment, and mixed the pigment in.

The Court: You haven't asked him that yet. I will sustain the objection.

Q. As I understand it, when you set out to make these quick drying inks at Hall's, after they had the I. P. I. quick drying ink, you bought the ink varnish from someone else? A. Right.

Q. And that ink varnish I suppose consisted of a solvent, with something dissolved in it, didn't it? A. That is right.

Q. And then what you did was to mix that with pigments and adjust the consistency and one thing or another and make the inks; is that right? A. Formulate it.

Q. I understand you do not want to tell us where you got that varnish that you made these heat-set inks from?

(811) A. I do not think it is necessary.

Q. You mean it would do you harm in your business—

The Court: Well don't pursue that. The Court has sustained the objection. Let us go on to something else.

Q. Were the I. P. I. colored inks in there as well as the black inks when you came to Hall's? A. No.

Q. You are sure of that, are you? A. Positive.

Q. Was the I. P. I. black ink tried out on— A. Wait a minute, I will take that back. In a sense—you are speaking of four-colored presses?

Q. I was speaking of heat-dried inks. I did not say how many colors there were. A. Well, I am still not positive.

Q. That is, there may have been I. P. I. colored inks in there? A. There is a possibility, but I wouldn't want to swear to it right here on the stand.

Q. When you made these inks did you use the same varnish in all the inks you made? A. No.

Q. You got different varnishes? A. Different viscosities.

Q. Did you find out what the varnishes contained? A. I know.

Q. What was it? A. Well, I think I just have—his Honor here said it wasn't necessary for me to answer it.

(812) The Court: That was where you got them.

Mr. Free: Again, Mr. Kerley, is that something you would rather not say? Is that a trade secret, or something?

The Witness: Well, I would rather not, yes.

Mr. Free: I think that is a question that ought not to be pursued, your Honor. It is immaterial anyway.

Mr. Byerly: It seems to me——

The Witness: I think it is a trade secret. I don't know why I have to tell it all here.

The Court: You mean what this ink is made of?

Mr. Free: Yes. These inkmakers are compounders, and they are very proud of their own little skill and their own little tricks. I think this is an effort to find out how he makes his inks. Maybe he makes better inks than I. P. I. does. It is one of those things that doesn't make any difference, and I do not think he ought to be pressed to answer a question like that.

Mr. Byerly: If your Honor please——

The Court: Well, if it is a trade secret—Is there a patent on it?

Mr. Free: No.

The Witness: No.

Mr. Free: Just the little tricks that they have in compounding, like a druggist does.

(813) Mr. Byerly: I am merely asking him what the vehicle is made up with.

The Court: You mean the solvent?

Mr. Byerly: The solvent, and the resins, whatever there were.

The Court: I do not see that it has anything to do with the case.

Mr. Byerly: That is what our patent is on, and it seems to me if this man has made any ink that is relevant to the case we ought to know what it is made of.

Mr. Free: Well, he is not a party here. He likes to keep these things to himself. It certainly is immaterial.

The Court: He is not a party to the case. He does not have to answer it. He told us it is a trade secret which will injure his business if he did answer it—is that correct?

The Witness: In a sense I would say that, your Honor, yes. I have a few little tricks, like any other ink maker, and I do not——

The Court: They are personal to you?

The Witness: They are personal to me, yes.

The Court: Things that you discovered?

The Witness: Well, I had quite a bit to do with it, yes.

(814) Mr. Byerly: I asked him, your Honor, the composition of the ink varnishes that he bought. That can hardly be his personal secret. The way he mixed them together after he got them may have some little trick about it.

The Court: I have already ruled on that.

Mr. Free: It is already passed.

The Court: All right, go ahead. I will sustain the objection.

Q. What gave you the idea of buying heat-set varnishes in 1937? A. Because we did not have the facilities to make our own.

Q. You never had at Hall's any of these quick-setting quick-drying inks, before you saw the I. P. I. ink, had you? A. No, that is right.

Q. Now, when you were in business yourself were you making intaglio inks, rotogravure inks? A. No.

Q. Have you ever sold rotogravure inks? A. Yes.

Q. But before 1937 did you ever try to make a typographic ink that would set by evaporating solvents? A. No.

Q. You knew that is the way rotogravure inks set? A. That is right.

Mr. Byerly: That is all.

Re-direct examination by Mr. Free:

Q. Mr. Kerley, you were asked whether or not it is (815) true that the red smudges on Defendant's Exhibit F-1, this little circular. You said it did a little. A. That is right.

Q. I managed to smudge the red on Exhibit KK. A. You can get it all off.

Q. They all do that? A. If you want to put enough pressure on there they all can get it. Some people have a sandpaper thumb or finger.

Q. But in ordinary use it does not come off? A. It came through our folder O.K., and dried sufficiently. That is the main thing we were interested in, and to be sufficiently dry that they would not smear after, after being collected on collecting machines for binding.

Q. Now as to these heaters which dry the ink. You said they are pretty hot? A. They are.

Q. Does the paper sometimes scorch? A. It does.

Q. I want to ask you about how much typographic ink you use in a year at this one plant of Hall's. Can you give me an approximate idea? A. Oh, 300,000 pounds—offhand. I don't know—something like that. It is a lot of ink.

Q. That is typographic ink? A. That is all typographic ink. That is aside from our subsidiary plant, to the best of my knowledge offhand here.

Q. How much does that subsidiary plant use; have you (816) any idea? A. Well, I imagine they use more. It is a different process. I don't know what their figures are. I wouldn't want to say.

Q. How many pounds a year did you say, 300,000? A. Three million—correction.

Q. Just one cipher wrong? A. Yes, that's all.

Q. How did these I. P. I. inks work in 1937 that you are asked about, that is the heat-settings? A. Well, they could have been improved, and they naturally had to improve them. I mean as time progressed. We had trouble. I mean we couldn't shut a press down for any length of time without having to spray immediately and they were very fast in the solvent, apparently.

Q. How did that manifest itself, that drying out of the solvent? A. Well, that would cause a gummy condition, so if you were printing in four colors instead of one you wouldn't do a good job of trapping one color upon the other.

Q. The ink would gum up on the rolls? A. However, in those days they weren't printing but one or two colors at the most. Ken Magazine was a two-color job they had at the time.

Q. You couldn't use these heat-set inks without a heater of some kind? A. No.

Raymond A. Kerley, for Defendant—Re-cross.

Q. It would stay wet all the time? A. Well, they would dry eventually, but you wouldn't be able to run them through (817) a press; that is through a folder.

Q. I think you said you worked for Metallic Ink Company; is that right? A. Yes sir.

Q. Metallic pigments are among the class— A. Well, the name is a little confusing there. It really did not have much bearing. They made a general run of commercial inks.

Q. Metallic pigments are in the class of ordinary pigments, aren't they? A. No. That is a metal.

Q. Yes, but it is a pigment? A. It is a pigment, so-called.

Q. Now in these flat-bed presses, where you said, I think, partial drying resulted— A. A setting.

Q. What do you mean by "a setting"? A. In other words, you print a sheet and it is wet to look at, and if it passes through a flame it will dull out, it will flatten down. You lose a little bit of the sheen, and it settles into the sheet a bit. It isn't dry.

Q. Is it still wet? A. It is still wet.

Mr. Free: That is all.

Re-cross examination by Mr. Byerly:

Q. May I ask you one question about these heaters that were installed there at Hall's. Do you know how much those heaters cost, what investment they made there in heaters in 1937? A. Yes—about $100,000 I would (818) say offhand.

Q. Do you know when they ordered those? A. Well, they were ordered in 1937, just what time—I could give you the installation dates of it.

Q. Are you sure they weren't ordered in 1936? A. They could have been, but I doubt it now. I say I doubt it. I don't know.

Q. Would it surprise you— A. I wasn't there.

Q. No, but would it surprise you to find the I. P. I. heat-set ink was the only one the company tested before they ordered those heaters? A. Would it surprise me? It probably would—I don't know.

Q. You don't know. A. As I say, I don't know.

Mr. Byerly: All right, that is all.

Mr. Free: That is all, Mr. Kerley.

Mr. Free: Now if your Honor will remember we held Mr. Taylor for further cross-examination, and I offer him now for that purpose on the question of these McElroy inks.

Mr. Byerly: All right, put him on.

CLINTON TAYLOR recalled.

Cross examination resumed by Mr. Byerly:

Q. Can you produce the memorandum you sent to Mr. Carroll in connection with the Doughty patent? A. No, I (819) cannot. To my recollection there was no memorandum that was taken to Mr. Carroll. The only memorandum was a telephone call that I would like to work in his plant with these inks on a large scale.

Q. But you did not give him any information about the Doughty patent? A. Not about the Doughty patent, no.

Mr. Byerly: That is all.

The Court: Whom did you give the information to?

The Witness: Mr. Carroll.

Mr. Free: That is all.

Mr. Free: Your Honor, I am embarrased. I thought it would take longer than this. I am not ready to go on with another witness until tomorrow morning.

The Court: Get all your witnesses together and have them all here tomorrow.

(Discussion off the record.)

The Court: Is there something else you can do this afternoon?

Mr. Free: I might suggest this: if the plaintiff wanted to go ahead with his rebuttal we could put on my witnesses tomorrow, interrupt that and put them on tomorrow and save that much time.

Mr. Byerly: If your Honor please, I do not like to put in rebuttal before the defense is concluded, but (820) there is this to be said——

The Court: You started to do it.

Mr. Byerly: Yes, I had to in one case, but I will be glad to do it again if it helps us, because we have a number of depositions on the commercial success and actual use of this ink. Of course Mr. Free is already familiar with this, and I would be glad to have some of those read this afternoon to fill in the time, if your Honor would consider that advisable.

The Court: Would that take the rest of the afternoon?

Mr. Byerly: Well those would have to be read before the end of the trial.

The Court: Whose depositions are they, Mr. Free's?

Mr. Byerly: No. They are the plaintiff's, which we took for rebuttal, and in case the validity of the patent has been attacked——.

The Court: If you care to do it go ahead, but I won't force you to.

Mr. Byerly: I should be glad to do it.

The Court: Any witnesses that are to be called must be here tomorrow at 10:30. I give notice to both sides. There won't be any further delay. They ought to be under subpoena before you give an excuse for their absence; but we will proceed, however.

(821) Mr. Byerly: If your Honor please, my associate tells me that if we have a 10-minute recess he will have the depositions and the exhibits all ready, and then we can go ahead and put those right in.

The Court: We will take a ten minute recess.

(Short recess.)

Mr. Byerly: We have asked the reporter to place these depositions in plaintiff's rebuttal, after the end of the defendant's case in the minutes, if that meets with your Honor's approval, rather than having them interjected at this point in the minutes.

The Court: Very well.

(The depositions referred to were read.)

The Court: Now what do we have tomorrow?

Mr. Watson: Tomorrow Mr. Free will have some testimony.

Mr. Free: Yes. I am going on with the testimony of one out of town witness from Massachusetts, and perhaps one more.

The Court: You will be through tomorrow?

Mr. Free: Yes.

The Court: And then what do you have?

Mr. Watson: We will have three witnesses, at least, I should say, rebuttal witnesses, depending on how many Mr. Free is going to put on.

(822) You are going to put one on tomorrow morning and one tomorrow afternoon?

Mr. Free: One or two. Either one will not take more than an hour, so I think tomorrow morning will finish me up.

Mr. Watson: You have two?

Mr. Free: Not more than two—let me put it this way, perhaps only one.

The Court: And I suppose you gentlemen want to furnish trial briefs?

Mr. Watson: Well I think we would abide by your wishes with regard to that.

Mr. Free: I would like to leave it up to you, your Honor. I would like to spend some time on a brief, but if your Honor wishes us to argue it——

The Court: I suppose I will have to take this case home and think about it.

Mr. Free: Or you can decide it from the bench.

The Court: If I thought I could I would let you argue it, but it is too big a case, too much involved. I think I will have to have you file briefs and dispense with the argument.

Mr. Free: Or we can do both. If it would be helpful to you to have an argument I would be glad to have an argument and a trial brief.

(823) The Court: We will see. Then you will have three witnesses after that?

Mr. Watson: I should say at least three.

The Court: Do you think you might finish tomorrow?

Mr. Watson: We might very well.

The Court: That is the testimony.

Mr. Watson: I do not think that my witnesses will take tomorrow afternoon.

The Court: Very well. We will adjourn until 10:30 tomorrow morning.

(Adjourned to Tuesday, January 26, 1943, at 10:30 a. m.)

(824) New York, January 26, 1943;
10:30 o'clock a. m.

TRIAL RESUMED.

Mr. Free: Last evening my out-of-town witnesses came in, and after talking to them I decided that their testimony would be largely cumulative and I would not bring them in this morning, and so I shall offer a few items and then close. Meantime I have called Mr. Byerly and told him what the circumstances were.

First I should like to offer as Defendant's Exhibit N-2 four patents which were submitted by the plaintiff in plaintiff's Particular No. 4.

The Court: What do you mean by "Particular"?

Mr. Free: Well, his bill of particulars. I asked him this question, "Submit information, including descriptive matter and drawings or photographs, necessary to complete understanding of apparatus and or process for effecting the steps stated in lines 19 to 22, inclusive, column 2, page 2 of the patent in suit, as follows: 'At the conclusion of the printing operation, the printed materials may be subjected, in known manner, to sufficient heat to dry the thin film of the (825) print very rapidly.'"

The Court: Where is that?

Mr. Free: At lines 19 to 22 of page 2, column 2.

His answer was: "Plaintiff submits copies of the following patents", and these are the patents that I am offering.

(Marked Defendant's Exhibit N-2.)

Mr. Free: Your Honor perhaps will recall that a plaintiff's *prima facie* case I asked him some questions about the diethylene glycol and offered a set of curves, which were marked for identification as Defendant's Exhibit A. This curve is a reproduction of Fig. 2 of an article in Industrial and Engineering Chemistry for July 1926,

which was referred to in the file wrapper of the patent in suit. First I would like to offer the complete article as Defendant's Exhibit O-2.

(Marked Defendant's Exhibit O-2.)

Mr. Free: And then I would like to——

The Court: What are they, vapor pressure curves?

Mr. Free: Vapor pressure curves, yes. I offer the enlargement of Fig. 2 of this article as Defendant's Exhibit A.

(Defendant's Exhibit A for identification (826) received in evidence.)

Mr. Free: Next I should like to offer the Lefferts and Stevens prints submitted by Mr. Taylor and marked now for identification. You will recall that on objection this was ruled out because Mr. Taylor was not a printer, he was not qualified to give the information. I now offer it as exemplifying Mr. Taylor's own work with the Lefferts and Stevens patent inks.

The Court: You mean his own work with that patent?

Mr. Free: He made prints, these prints are Exhibit I for identification.

The Court: According to that patent?

Mr. Free: Yes, so I am not offering them as a work of an expert printer but rather as exemplifying the inks of that patent, and I offer them as Exhibit I.

Mr. Byerly: I object to this on the ground that the witness's testimony showed that they were not made in accordance with the patent under which they purport to be offered, that is, the Leffer's and Stevens patent. You may remember that the witness testified that half-second cotton did not appear until after.

Mr. Free: There is no half-second cotton on that, but there is resin.

(827) Mr. Byerly: That is another one of the inks he made?

Mr. Free: All of these ingredients are named in the Lefferts patent and the witness testified they were, and he pointed to the patent that they were there. The only question as to the exhibit was his expertness to describe the quality of the printing, so I am offering it merely as exemplifying his work with the Lefferts and Stevens inks.

The Court: It may be admitted.

(Defendant's Exhibit I for identification received in evidence.)

Mr. Free: If your Honor will recall, yesterday I offered the file of the abandoned application mentioned in the patent in suit and pointed out that it was for a process, and that application having been abandoned by the plaintiff the process belongs to the public generally, and this patent here in suit is confined to the ink. Notwithstanding that, the correspondence between the plaintiff and defendant's attorneys indicates that the plaintiff is attempting to broaden the patent here to include process as well, and I should like to offer in evidence a letter dated July 22, 1941, from Interchemical Corporation to Messrs. Nims and Verdi, who were at that time attorneys for the defendant. (828) That was before I got in, and it mentions the patent in suit and is in response to the warning notice of the plaintiff to the defendant, and it inquires particulars. It said, "What claims are you talking about?" etc. So the paragraph of the letter which I would like in evidence reads:

> "While our letter to your client relates to any inks which your client is manufacturing or selling which infringe our U. S. Letters Patent No. 2,087,190. We refer more particularly to inks which are designed to be set by the application of heat and which are sold to publication printers for use on rotary presses equipped with heating units."

I offer that letter as Defendant's Exhibit P-2.

Mr. Byerly: I object to that as immaterial.

Mr. Free: It is correspondence between the parties, and I think it is distinctly material. It mentions the patent in suit, and in fact this suit——

The Court: You claim this broadens the patent here?

Mr. Free: Yes, they are trying to cover all the inks that are designed to be set with the application of heat, and I simply want that in the record to show what the effort of the plaintiff is, notwithstanding its very (829) narrow patent here.

The Court: What is the legal effect of that? What are you going to argue from it? What is its probative value?

Mr. Free: It bears directly on the issue that I mentioned in the opening statement, that the patentee here is trying to broaden his patent to include more than his invention.

The Court: By this he means he is claiming all solvents that are evaporated by the application of heat?

Mr. Free: That is right.

The Court: I will receive it, but I do not see much use in it.

(Marked Defendant's Exhibit P-2.)

Mr. Free: Also to emphasize the distinction between the method which is in this abandoned application, Exhibit M-2, and the patent in suit, I would like to read into the record the claim which the plaintiff abandoned to the public on the method.

Mr. Byerly: Isn't that part of the file wrapper? Have you put that in? Are you reading from one of your exhibits?

Mr. Free: Yes, I am reading the method from the file wrapper of the method of application.

(830) Mr. Byerly: Did you put that in?

Mr. Free: Yes.

Mr. Byerly: I think the exhibit speaks for itself. There is no point reading parts of it into the record. If he wants

to put that file in, your Honor will presumably have to examine the whole file to see what it is all about.

Mr. Free: I would like to dig out this one claim.

The Court: The Court would like to know what parts you rely on so that it won't have to read through a lot of useless material. Go ahead.

Mr. Free: I will refer to page 29 of Defendant's Exhibit M-2:

> "The method which comprises printing upon a continuously traveling web with an ink comprising a coloring material and a vehicle therefor containing a thickening agent and solvent with a sufficiently low vapor pressure to make the ink suitable for all press-room printing conditions, and thereafter increasing the vapor pressure by the application of heat to the web and thereby substantially evaporating the solvent to make the ink sufficiently dry to permit the second side printing without smudging."

(831) Now that is the method which the plaintiff here has abandoned, and he did so formally on December 29, 1940, as shown on page 40 of Defendant's Exhibit M-2 where Mr. Gessler signed this formal abandonment for himself and Interchemical Corporation by someone whose name I cannot read but the secretary affirmed it, where Interchemical Corporation also abandoned this application. I mention this because it must be clear that the patent in suit is confined solely to an ink and that the method belongs to the public, including the defendant.

Mr. Byerly: May I see that for a minute, please?

(Mr. Free hands to Mr. Byerly.)

Mr. Free: I would now like to ask Mr. Byerly to produce the letter which I asked for yesterday in the notice to produce, of which he kindly gave me a copy last night. This is a letter dated February 8, 1928, by Carbide & Car-

bon Chemicals Corporation to Cray-Finne Company—your Honor will remember that was the company which was bought out by the plaintiff here, and Mr. Cray and his company worked with Gessler to formulate this ink.

This letter, the original of this letter was obtained from plaintiff's own files in accordance with notice to produce. It is addressed to the Cray-Finne (832) Company—presumably it has been in the plaintiff's files ever since and the Cray-Finne's files prior to that, and I offer it in evidence as Defendant's Exhibit Q-2. This letter——

Mr. Byerly: If your Honor please, I object to the offer.

The Court: Let him finish his offer.

Mr. Byerly: Oh, I am sorry.

Mr. Free: This letter is addressed to Cray-Finne Company by Carbide & Carbon Chemicals Corporation.

The Court: A third party?

Mr. Free: Yes, the manufacturer, if you will remember, of the butyl carbitol. It suggests to the Cray-Finne Company not only ethylene and diethylene glycol but also carbitol and butyl carbitol. I want this letter in evidence because——

The Court: You say it suggests what?

Mr. Free: That carbitol and butyl carbitol as early as February 8——

The Court: Suggesting it as what, a drier?

Mr. Free: No, the Cray-Finne Company is an ink company——

The Court: Suggest that they use it?

Mr. Free: Well, I will read it:

> "Gentlemen: We recently forwarded you samples (833) of Ethylene Glycol and Diethylene Glycol for experimental purposes. As we have not yet received any word regarding the results which you obtained with these materials, we are taking the liberty of writing for this information.

"We are pleased to announce two new solvents, Carbitol and Butyl Carbitol, which are the monoethyl ether of Diethylene Glycol and the monobutyl ether of Diethylene Glycol, respectively."

Then it goes on and mentions prices, which I won't read. In the second last paragraph it states:

"If you are meeting with difficulties in the application of either of the above compounds to your specific problem, we could no doubt be of assistance to you in view of the extensive experience we have had with these compounds."

The Court: Why is that binding on the plaintiff, written by a third party?

Mr. Free: I would like to have this in because this is a recommendation by the producer of butyl carbitol to Cray-Finne Company, which is part of the plaintiff company now, prior to the time that Gessler did any experimenting, according to his own statements so far, recommending butyl carbitol——

(834) The Court: You mean he got the idea from that letter?

Mr. Free: That is what I shall contend, yes.

The Court: I do not think it is binding in the slightest on him—written by a third party. It is a gratuitous writing.

Mr. Free: Well, it shows a direct instruction from the manufacturer of the stuff, butyl carbitol, to Cray-Finne for using butyl carbitol.

The Court: They are just trying to sell a product to them. I will sustain the objection.

Mr. Free: Then may I add something. I would like also to put this letter in to show that butyl carbitol was a new product by the Carbide & Carbon Chemicals Corporation on February 8, 1928.

The Court: Well, it is a hearsay statement. I will rule it out.

Mr. Free: Also I should like to offer in evidence as the state of the art another Doughty patent, No. 1,439,695, as Defendant's Exhibit Q-2.

Mr. Byerly: Your Honor, I object to this. The defendant has put in a bill of particulars stating the patents on which they were going to rely, both the state of the art and the anticipation of this patent and this was not mentioned in either instance. I do (835) not see any reason why it should be brought in at this time after their expert has testified.

Mr. Free: I am putting it in merely as a state of the art which I can always show, and also it is a file wrapper patent, which is another way of getting it in, cited during the prosecution of the patent in suit.

The Court: I will admit it.

(Marked Defendant's Exhibit Q-2.)

Mr. Free: Defendant rests, your Honor.

REBUTTAL PROOFS

(836) Deposition read in evidence of Edward B. Busby produced as a witness for plaintiff, who, being first duly sworn, deposed and said:

Direct examination by Mr. Watson:

Q1. State you name, please. A. Edward B. Busby.

Q2. Where do you live, Mr. Busby? A. 4828 Kimbark Avenue, Chicago, Illinois.

Q3. What is your occupation? A. I am General Superintendent for R. R. Donnelley & Sons Company.

Q4. How long have you occupied that position? A. Since 1934.

Q5. The business of R. R. Donnelley & Sons Company, as I understand it, is printing. A. Printing, binding, engraving, lithographing, rotogravure work.

Q6. You have been subpoenaed to testify in this case today? A. Yes, I was subpoenaed.

Q7. What types of press are used by you in the printing performed here? A. You want me to tell all the types of presses that we use?

Q8. By that I mean, you do typographic, or letter-press printing? A. We do letter-press printing; we do rotogravure printing; we do lithographic or offset printing. We have three basic types.

Q9. As I understand it, letter-press printing is that in which you use raised characters which transfer ink to the matter to be printed upon, such as paper? A. That is correct; that is right.

Q10. Whereas, in rotogravure printing, your (837) characters are engraved below the surface of your printing cylinder? A. Perhaps I can say it in my own words.

Q11. If you will. A. Letter-press printing is printing that has raised characters, either type or plates.

Lithographic printing is printing from a surface that is practically flat and is printing by a principle that oil and water do not mix.

Rotogravure printing is intaglio, so that you are actually printing from a reverse surface, the ink being pulled out of the wells in the cylinders.

I think that is about the simplest.

Q12. You use very different types of ink with each type of printing; that is, each type requires its own type of ink, is that right? A. Yes.

Q13. That is, you could not use the same ink for rotogravure or typographic printing, or letter-press printing, and vice versa, isn't that correct? A. That is correct. But on letter-press printing we use two entirely different kinds of inks.

Q14. What kinds do you use? A. We do some of our printing by the old standard process, where we use oil inks. We also use heat-set inks for a great deal of our printing.

Q15. Are those oil inks that are also referred to (838) as the oxidizing type inks, linseed oil inks, for instance, is that what you mean? A. When I refer to oil inks, I refer to the inks that dry by either oxidation or absorption.

Q16. I see. A. I am not an ink maker; I am a printing press superintendent.

By Mr. Free:

Q17. Do you feel qualified to answer those sorts of questions? A. Yes, I do.

Q18. You know that they dry by oxidation in the class that you mention? A. Oil inks?

Q19. You know that they dry by oxidation? A. Yes.

By Mr. Watson:

Q20. How long have you been using other inks than oil inks; or do you call them heat-set inks? A. Heat-set inks.

Q21. How long have you been using these, Mr. Busby? A. I wonder if, in order to answer that question, it would be all right for me to read a memorandum that I have prepared, which gives the history of what we have done with heat-set inks; is that satisfactory?

By Mr. Free: Will you tell me where you got the information? Is it from the records of the company? I would rather not have you read it. I would rather have you refer to it to refresh your recollection, if those dates can be authenticated from the records of the company.

The Witness: The reason I wanted to read it was (839) that I wrote it down because I wanted to

be sure that the information that I have put in here is accurate.

Mr. Free: I would rather have you state the story from your recollection, in your own words without reading the paper.

By Mr. Watson:

Q22. The paper that you have referred to was prepared by you personally, referring to your own personal experience and records of the company? A. Yes. No information was furnished me by anyone else. No one else had anything to do with the writing of the paper, and no one had any part in the information I have here. Almost all of this is my own personal recollection. I verified a few dates.

Q23. I see. I think my last question was, when did you first begin to use heat-set inks. Suppose I withdraw that question and ask you to tell us the history of the use of heat-set inks by your company. A. All right. The first time that I heard anything about heat-set inks was sometime early in 1935 when Mr. Whinnery, who was head of our Purchasing Department, and who called me into his office and introduced me to a Mr. Moscovics, who was connected with the Levey Company, and we talked about the possibility of using this new heat-set ink. I think they referred to it as "Flash-Dri" ink at that time.

(840) I did not do anything about it at that time, and in November, 1935, Mr. Whinnery again called me in and introduced me to Mr. Roderick Smith of the International Printing Ink Company.

Mr. Smith told me that I. P. I. had been experimenting with an ink which was similar to Levey's "Flash-Dri" ink, and that they were in a position to put that into production in a printing plant.

We were very anxious to cooperate with any experiments that could be conducted, because we realized that

an ink of this kind, if it could be made to work, would revolutionize letter-press printing.

Mr. Free: When you say "we", you mean, yourself, don't you; that is your opinion you are giving?

The Witness: Yes, I do.

By Mr. Watson:

A23. (Continuing). At that time I discussed it with our press-room superintendent, and then other technical men in the factory. Mr. Young, who was superintendent of our press-room, was probably one of the best press engineers in the country; he is also our chief engineer; and when I talked to him about it, he and I realized immediately we had——

Mr. Free: What I wanted to point out is, what you know yourself, in your opinion, is all that will be used by the Court here, and not what someone told you.

(841) The Witness: Yes. I should not say "we". I should say "I" throughout.

Mr. Free: Yes.

By Mr. Watson:

Q24. That was the editorial "we" you were using, was it, Mr. Busby? A. Yes.

Now, the reason for that was that up till then, this time, we had been forced to confine our printing on rotary presses to absorbent stocks, and we had not been able to print on rotary presses and perfect the printing on coated paper without considerable offsetting.

We had used other anti-offset methods, like the starch sprays; but they had not produced the results that we needed.

Now, if this new ink would make it possible for us to print on coated papers, or enamel papers and perfect the sheet and then immediately fold and deliver folded sig-

natures from the press, it would enable us to print a great deal faster than we ever had been able to print on flat bed presses on this kind of papers.

The next step up with the International Printing Company line was some drying equipment that they developed, and we installed this on Press 2, and the experiments that we conducted on this press showed a lot of promise.

(842) I also remember that about that same time we tried out some Levey inks in addition to the I. P. I. inks; but our experience with Levey inks was not quite as good as the I. P. I. inks then.

About that time Time, Incorporated, conceived the idea of a new pictorial magazine which they wanted to print on coated papers.

They wanted to produce a high grade job, and they wanted to produce it at speeds that would be impossible by the old-fashioned flat-bed methods.

Based on our experience on Press 2, and the promise that they showed, we entered into a contract with Time Magazine to print the new pictorial magazine, which was later called "Life".

Our original arrangement was to print 400,000 copies a week, and from the production picture that they first gave us we expected to produce about 250,000 copies and then gradually work up to four hundred or five hundred thousand copies.

The first issue, which was November 23, 1936, called for a printing order of about 350,000 copies. It grew by leaps and bounds. By January we were printing 700,000 copies, and by July over a million.

In the years since then, it has continued to grow so that at the present time we are printing (843) approximately three and one-half million copies——

Q25. Is that per week, Mr. Busby? A. Per week; and Cuneo's are printing six or seven hundred thousand copies in their eastern plant at Philadelphia.

Mr. Free: Is Cuneo a part of the Donnelley Company?

The Witness: No, sir.

Mr. Free: Then all you know about Cuneo is what you heard.

The Witness: No, that is not all I know about Cuneo, because we print all of the color work and ship it to the eastern plant.

Mr. Free: I see.

By Mr. Watson:

A25. (Continuing) And we also print some of the 2-color heat-set printing and ship it to the eastern plant; so I am sure there have been at least 700,000 copies, because we are shipping it out to that plant at this time, so it is not hearsay. Cuneo's only print the body, and they do not print all of the color work, and they do not print any of the covers and inserts. Their quantities run higher than the figure I give. I have been conservative in that figure.

Now, our first printing of heat-set ink was done by the converting of presses we had, putting special heating equipment on, which we designed on other (844) presses, which would print Life size. I say that that is the first printing after the printing we did on Press 2.

Now, as soon as we signed a contract with Life, we placed an order for four 64-page, single color presses which we bought from the Hoe Company, and they were specially designed for heat-set printing, and were able to run at faster speeds than the equipment we had up to that time.

Later we bought—later, over a period of time, we have bought four more 64-page heat-set presses, 2-color presses, for printing Life 2-color work.

Time Magazine is also being printed by this same process. We bought some special presses from the Hoe Company.

Can I change that? We bought two special presses from the Hoe Company for printing Time, and we converted two other presses to use this same heat-set press.

We print eight or nine hundred thousand a week of the Time Magazine, and we ship enough color-work to Cuneo's eastern plant so that they can bind approximately half a million a week.

We also equipped a number of our 2-color rotary presses so that we could print Sears, Roebuck (845) and Montgomery Ward 4-color rotary printing by this same heat-set process. We print the 4-color by using a 2-color press and printing half the normal capacity of the press.

We have also bought a number of 5-color perfecting presses from the Cottrell Company, which uses this same heat-set process.

These presses will print four or five colors on each side of the sheet and deliver perfected sheets. One of them has a folder on it which delivers folded signatures.

We also use this process in the printing of Farm Journal Magazine, a monthly, which runs about two and one-half million copies per month.

I believe that I am safe in saying that the development of this process has enabled us to just about double our volume of business. I believe the statistics that show the amount of paper that goes in and out of this plant, in 1941 or 1942, as compared to 1935, would show this.

I think that is about the story of what has happened here at the plant.

Q26. There are some terms you have used, Mr. Busby, that would seem quite technical to a person not familiar with what I find to be a very technical industry. I think (846) we ought to have a definition of those terms in the record. Are you printing Life at this moment? A. Yes, sir.

Q27. Now, you mentioned "signatures" and "folded signatures", and so forth. I wonder if we could see a

signature of Life as it is now being produced, which is unfolded, and one which is folded, for the purpose of illustration, and see what we are talking about on that? A. Yes. I can give you folded signatures, and I can give you flat sheets.

Q28. I wonder if we could have one. A. I can give you a sheet of Life Magazine, the color work printed with oil inks, where we print only one side and let it dry, and back it up on another press.

Q29. All right. A. And I can give you similar signatures which may be printed on a rotary press with heat-set inks, where we perfect the sheet and fold it in one operation on the press.

Q30. I think it would be very helpful if we could have that. A. I will get them right now.

Q31. I would like the record to show that Mr. Busby was good enough to conduct us through a portion at least of the plant of the Donnelley Company, where we saw printing actually being done; by "we", I mean counsel for plaintiff and counsel for defendant.

(847) In the course of that trip we picked up several things that I believe you have referred to previously as signatures; is that right, Mr. Busby? A. The ones that are folded are called "signatures".

Q32. I see. And what are those that are not folded? A. Well, we refer to them as printed sheets.

Q33. Printed sheets. All right. A. Strictly speaking, in the old terminology, they are all signatures; but that is not the modern nomenclature.

Mr. Watson: I offer in evidence a sheet printed on one side.

Mr. Free: I object on the ground that there is nothing to indicate what ink it was printed with.

(Marked Plaintiff's Exhibit 39.)

By Mr. Watson:

A33. Exhibit 39 is a sheet printed on one side only with oil inks. After this has stood for some time and is thoroughly dry, we print the back-up by putting the sheet through a press the second time.

Q34. By the "back-up" you mean the under side? A. Yes.

Q35. And the side which now is blank? A. Blank.

Q36. You said that it stands for some time before the second side is printed. Approximately how long, Mr. Busby? A. That depends on the heaviness of the printing. But it is usually about twenty-four hours before (848) it can be backed up, and then it is another twenty-four hours before it can be folded.

Q37. After the second side? A. After the second side is printed, that may be a period anywhere from twenty-four to thirty-six hours.

Q38. On this you are referring to now is what you previously said were with old oil inks, is that right? A. That is right.

Q39. How long do you think it would be necessary for this sheet to stand before the second side could be printed? A. Normally we would allow twenty-four hours.

Q40. I believe you noticed that counsel for defendant has a duplicate of this Exhibit 39, and happened to rub it and a lot of the ink rubbed off on his hands; is that correct? A. Yes. But that is because it has been recently printed, and that is what you would expect.

Q41. That is characteristic of these oil inks when they are recently printed, they smudge that way? A. They have to be handled very carefully when first printed.

Q42. Now, is that ink coming off on his hands an example of what you might call "offset", or "offsetting"; you used that term? A. Well, "offsetting" normally refers to ink coming off of one sheet onto another sheet.

Q43. I see. A. We generally keep our hands off of it.

(849) Q44. I see. I call your attention to another sheet which we picked up in the course of our tour through the plant, Mr. Busby.

Mr. Watson: I offer this printed sheet in evidence.

Mr. Free: I object to that also. There is nothing to indicate what ink it is, whether it is of the patent in suit or anything else.

Mr. Watson: It is identified in the patent.

The Court: The objection is overruled.

(Marked Plaintiff's Exhibit 40.)

By Mr. Watson:

Q44a. Will you please identify that printed sheet and explain what it is, and how it was printed? A. This sheet was printed with heat-set inks on Press 89.

Q45. In how many colors? A. It is printed in four colors on each side of the sheet. The perfected sheets are completely printed sheets, and are delivered thoroughly dry.

Q46. That is, they are delivered from the press as they are printed, thoroughly dry? A. They are delivered in the delivery of the press thoroughly dry; can be immediately used.

Q47. Yes. At what speed do they travel through the press, Mr. Busby. A. About 8000 an hour is the running (850) speed.

Q48. That is, 8000 impressions of this type? A. Yes, running speed; with a net production of over 5000 an hour on this one.

Q49. At what speed did the sheet of Exhibit 39 travel through the press when it was printed on one side? A. About 5000 an hour, with a net production of about 3000 an hour.

Q50. This sheet, Exhibit 40, was picked up as it was delivered from the press, was it not? A. It was picked up

just as it pulled through that delivery of the press, yes, sir.

Q51. And you found the inks to be thoroughly dry? A. Yes.

Q52. I call your attention now to some printed matter which appears to be in the size of a magazine sheet, and is folded.

Mr. Watson: I offer in evidence this printed sheet.

Mr. Free: I also object to this one, upon the same ground that there is nothing to indicate the composition with which it was printed, whether it comes within the patent in suit or not.

The Court: The objection is overruled.

(Marked Plaintiff's Exhibit 41.)

(851) By Mr. Watson:

Q52. (Continuing). Will you please identify Exhibit 41, and explain how it was produced, Mr. Busby? A. This signature was printed on Press 100.

Q53. That is what you call the signature, is it? A. Yes, sir, a folded signature.

Q54. I see. A. It was printed in four colors on each side of the sheet, and the printed sheet was then passed through a folder and the folded signatures delivered from the press, the point being that the sheets were dry enough to immediately fold, without offsetting.

Q55. Printed on both sides in the one press? A. Yes. This press runs at a running speed of 10,500 an hour, and with a net production of approximately six thousand to seven thousand an hour.

Q56. You are using the heat-set type of inks now, of course? A. Yes.

Q57. I call your attention to another signature.

Mr. Watson: I offer another signature sheet in evidence.

Mr. Free: I would like to make the same objection as to that one, as it has no connection with the patent in suit.

(Marked Plaintiff's Exhibit 42.)

By Mr. Watson:

Q57. (Continuing). Will you please explain that Exhibit 42 and explain how it is produced, (852) Mr. Busby? A. This 2-color signature was printed on a 2-color Life 64-page press. The press prints one side of the web, dries it and then prints the second side of the web and dries it, and then the web is passed through a folder and folded signatures are delivered from the press completely dry.

Q58. Is such a press known as a web perfecting press? A. Yes.

Q59. By "web", do you mean a continuous roll of paper fed through the press, as contrasted with separate sheets? A. A web press is a press which feeds roll stock from a web through the press and it stays in web form and is not either cut or folded until after the printing is done.

Q60. I see. It is a continuous ribbon of paper, is it not? A. That is right.

Q61. And that term, "perfecting", what does that mean? A. A perfecting press is a press which prints both sides of a sheet.

Q62. That is, it prints one side and then immediately prints the other side? A. It prints one side, and it prints the second side immediately afterward, with just a slight interval in between.

Q63. A split second. Maybe not so little as that? A. Well, the time between the first and the second side (853) depends on the speed of the press and the length of the web lead, but at most only a few seconds.

Q64. I see. A. The point is that when the sheets or signatures are delivered, they are perfected, completely printed. This press runs approximately 11,000 an hour

and we get a net production of seven or eight thousand an hour.

Q65. Using heat-set inks? A. Using heat-set inks.

I want to make this a matter of record, too. There is one thing I failed to mention in my other conversations regarding the development of this process.

There had been, prior to the development of this heat-set printing, quite a trend toward rotogravure printing and, as the result of our ability to print coated papers by this process, the tendency has been to go back to letter-press printing, particularly with color work. Life's advertisers and Times' advertisers and Sears, Roebuck and Montgomery Ward seem to prefer 4-color letter-press to 4-color gravure. We developed a lot of additional 4-color mail order business as the result of our ability to do this by this process—to print it by this process, I should say.

Q66. I call you attention to a signature.

Mr. Watson: Which I will offer in evidence as (854) Plaintiff's Exhibit 43.

Mr. Free: I make the same objection, as there is no connection with the patent in suit as indicated by this ink.

The Court: What is the probative value of this?

Mr. Watson: It gives you an illustration of precisely what is produced by this heat-set ink.

The Court: Whose heat-set ink?

Mr. Watson: Plaintiff's and plaintiff's licensed ink.

The Court: You want to specify the kind of ink that is used, don't you?

Mr. Watson: That will be connected up, of course.

The Court: I will admit it on the understanding that it will be connected up.

Mr. Watson: If you want the connection now we cannot go ahead today.

Mr. Free: No, it is not necessary to have the connection now.

(Marked Plaintiff's Exhibit 43.)

By Mr. Watson:

Q66. (Continuing.) Will you please identify that and explain how it is produced, Mr. Busby? A. That is a single-color heat-set signature. What I mean is, it was printed with a single color by the heat-set process. It was printed on a 64-page Life press, (855) perfected and folded on that press, at a running speed of approximately 12,000 an hour, and a net production of eight to nine thousand an hour.

Q67. I now offer in evidence a signature——

Mr. Watson: Which I will offer in evidence as Plaintiff's Exhibit 44.

Mr. Free: I do not like to interrupt all the time. May we let the record show that my objection continues throughout this deposition, because there is nothing to connect the ink up with these printing jobs?

The Court: Very well.

(Marked Plaintiff's Exhibit 44.)

Mr. Watson: A signature which I will ask you to identify and describe how it was produced.

A. This is a single-color signature for Time Magazine. It was printed on a 64-page Time press, perfected and folded on that press.

The running speed is approximately 14,000 to 15,000 an hour, and the net production about 10,000 an hour.

The reason that this speed is higher in revolution is that it is a smaller signature than Life, the web speed on the two types being approximately the same. By "web speed" I mean web speed in lineal feet per minute.

(856) Q68. Did you state whether this was printed with heat-set ink, Mr. Busby? A. It was printed with heat-set inks, yes.

Q69. I notice that this signature, Exhibit 44, bears date December 21, 1942. That I presume, means that it is the December 21st issue of Time; that is the one that will be brought out as of December 21st this year, is that right. A. Yes.

Q70. When will they go to the newsdealers or distributors, or whoever gets it? A. Well, it is being distributed all over the country now, for distribution on the newstands tomorrow and Friday.

Q71. I see. When did you go to press with this issue? A. Tuesday morning.

Q72. That is, yesterday? A. Yes.

Q73. Have you any idea how many pages there will be in it? A. No. I can give you a copy of a completed magazine, though, if you want it.

Q74. One is available, is it? A. Yes. I don't know accurately; that is why I do not answer that question.

Your question about the speed with which we produce Time Magazine, I think the best way I can answer that is by saying that we normally go to press Tuesday morning and that normally we are off the press sometime early Wednesday. This particular week we are printing some (857) of Cuneo's edition, so we are running a little longer than usual. Since you did raise the question, I state that.

Q75. The first sheet offered in evidence, that is, Exhibit 39, was that printed on a rotary press, the one with the old-fashioned oil ink? On one side only. A. Well, I think that in answering that question I ought to say that there is some confusion in the industry in the term "rotary press". It was not printed on a web-fed press. It was printed on a sheet-fed press. It was printed from curved plates.

Sometimes people refer to a "rotary press" as a sheet-press which prints from curved plates but feeds sheets.

A flat-bed press is a press which prints from a flat press and feeds sheets.

The term "rotary" does not refer to a web-fed press always, but usually it is, but people do not always refer to it as such.

Q76. The remainder of the exhibits, 40 to 44, inclusive, were all printed with web-fed rotary presses, is that right, those using heat-set inks? A. That is right.

I might say one other thing in this connection; that all of 1-color and 2-color Life and Time were printed (858) on heat-set inks, and a large percentage of the 4-color is also printed with heat-set inks. But some of the 4-color is printed with oil inks on one-side presses and then backed up with oil ink, a separate operation.

That answers that question, some of the color work is oil inks, you know.

Q77. Do you know, Mr. Busby, where you obtained the inks that you used for printing these Exhibits 40 to 44, inclusive, that you told us that you print with heat-set inks? A. No, sir. I know that we buy a great deal of our heat-set inks from I. P. I.

Q78. I see. Is that the ink known by the trade name "Vaporin" and called "Vaporin Ink"? A. Yes, that is.

Q79. The Levey inks are known by the trade-name of "Flash-Dri", are they not? A. That is right. The reason I say I don't know where these inks came from, we do not buy all our inks of the I. P. I. We buy some from American, and other sources, and I am not sure which of these inks were bought from which company.

Q80. I see. Are these heat-set inks stable on the press; that is, do they stay moist on the press while you are running, that is, on the rollers of the press? A. Yes. We do not have any trouble when we are running. Sometimes when we shut down, in order that they won't dry too soon, we have to spray the rollers——

(859) Q81. I see. A.——to stop the ink from drying on the rollers.

Q82. I see. How long would it take you to print Life Magazine if you used the method you described in connection with the Exhibit 39 which was printed with oil inks, that is, one issue? A. Oh, that would be pretty hard to say. If you filled this entire building clear full of equipment you might do it in the same length of time. It would take—let me answer that another way.

When you print with heat-set inks, we are printing the body at eight or nine thousand an hour and perfecting it; and if we were printing with oil inks, even if we used anti-offset solutions on the presses, we would have to—we would run at a much slower rate, print one side at a time, and then have to fold as a separate operation. The length of time it would take would depend upon how much equipment we were able to buy and put into the block. But even if we had the most equipment that you could get, it would lengthen out the time probably forty-eight hours, because we would have to have these drying times anyhow.

Q83. Could we get at it this way: Suppose that you had the same number of—for want of knowledge of a technical term, I will say—linseed oil ink presses or oil ink presses; suppose you have the same number of (860) these as you have of the presses using the heat-drying inks; can you tell us how long it would take then? A. No, I do not want to attempt to answer that question, because you could not print this job on this coated paper with rotary presses——

Q84. I see. A. —without offset.

Q85. I see. A. You would have to go to some other slower type of equipment, and what would develop there, I don't know. I do not want to answer that question because it would require a lot of engineering; with the use of oil I know it would take a lot longer then.

Q86. Much longer? A. Yes.

Q87. How long does it take at present for Life? A. We print around three and one-half million copies in eighty hours.

Q87a. Eighty hours? A. Of the current form, yes. That is, eighty hours right around the clock.

Q88. How large is this plant, Mr. Busby? A. Approximately a million square feet of manufacturing space. It is a square block and eight stories high.

Q89. How does it compare with other printing plants in size? A. I understand it is one of the largest printing plants in the world, and it has several millions dollars worth of new fast printing equipment.

Q90. You said that you had purchased some new (861) presses to take advantage of these heat-set inks, and you showed several of them to us.

I wonder if you could give us an idea of the cost of the presses, Mr. Busby? A. Well, I might say that the eight rotary heat-set presses that we bought for Life cost from one hundred and fifty to two hundred thousand dollars each. I do not want to give accurate figures, because that is a firm secret.

Q91. I see. I do not want you to divulge any secrets. A. I would like to have read what I said before.

Q92. How does the quality of the printing obtained through these heat-set inks compare with the quality of the printing obtained through the previous oil inks? A. It is approximately the same.

Q93. The heat-set inks, as I understand it, have enabled you to increase the output of a press; is that correct? Your printing operation is much speedier through the use of heat-set inks, is that right? A. Somewhat speedier, because we do not have to stop and wash up as often. But the main point is, that we are able to print on an entirely different kind of paper than we used to print on. Rotary presses used to have to print on softer papers, more absorbent papers, print papers and E. G.'s, English finishes, and now we are (862) able to print on coated papers. There is some increase in production.

Q94. By "coated papers", you mean to distinguish from absorbing papers, is that right? A. Yes. I mean by "coated papers" either a machine coated paper, where the paper is put on a paper machine, or enameled papers where the coating is put on as a separate process.

Mr. Watson: In order that the record will be complete, I have here a copy of Time Magazine of the issue of December 21, 1942, which I have purchased personally on a newsstand and which I note contains 112 pages.

The Court: What do you want to do with it?

Mr. Watson: I should like the record to show that that particular issue does contain 112 pages.

Mr. Free: I will admit it contains 112 pages, and we can dispense with the magazine.

Cross examination by Mr. Free:

Q95. I understand you have some rotogravure presses in the plant? A. Yes, we have.

Q96. How does the speed of the heat-set press compare to the rotogravure press; are they about the same? A. Yes, they are. On our rotogravure presses, (863) those that we have print single-color and 2-color; so I have no firsthand knowledge of the speed of 4-color rotogravure presses.

Q97. I see. But insofar as output of the two is concerned, with equal color combinations, the rate is about the same? A. That is right.

Q98. But on these rotogravure presses you use heaters to dry the ink after the web goes off the press? A. Yes.

Q99. And that heater causes the solvent in the ink to be driven off in the same way as the solvent in the heat-set ink is driven off; is that right? A. No. I do not think it is the same way.

Q100. But you have hoods with which to draw off the vapors, do you not, each press? A. Well, we draw off the

vapors on a rotogravure press; but there is nothing like the amount of fumes or the problem involved that there is with letter-press drying.

Q101. I see. Do you know whether or not your rotogravure presses have closed fountains to retard evaporation? A. They do not have closed fountains. Closed fountains are specially patented and are only used by people who are licensed to use them, and we found that we can run at our speeds without closed fountains. We have no problem there.

(864) Q102. But it is a fact, isn't it, that in the fountain the rotogravure ink is much more volatile than the heat-set ink? A. I cannot answer that question. I wish that I could. But I practically cannot. You might ask our ink man that question if you want to.

Q103. In a sense, therefore, the rotogravure ink is heat-set also, is it not? A. Well, let me answer that another way. The rotogravure process was a process which was in existence; nothing like that had ever been developed for letter-press printing; and then Levey and I. P. I. came along and developed something for letter-press printing that is superior to what we had on rotogravure printing. But it is not similar; it is a different process.

Q104. You distinguish between the two in the method of printing; that is, one being letter-press printing, and the other being rotogravure printing; is that right? A. Well, I distinguish between them even more than that, because the rotogravure inks could not be used for letter-press printing, and the letter-press inks could not be used for rotogravure printing. They are entirely inherently different.

Q105. What I am getting at, however, is the process of drying the ink is about the same; you apply the ink to the web and after it is applied to the web you apply (865) heat to the printed web, and in that way the ink is dried on the web. A. Well, I believe it is entirely different because

these processes that we use for drying the rotogravure ink would not work at all for heat-set printing; and where other people tried to use it, they were not successful with it.

And the process that we use on letter-press printing would be absolutely fatal if we tried to apply it to rotogravure printing, because you cannot use gas or flames around rotogravure because they are highly inflammable, and you would burn the place up.

Q106. But you do dry rotogravure inks with hot air, do you not? A. They use hot air.

Q107. What I am really getting at, in these things the processes are similar; that is, you apply the inks to the web, and then the ink is dried by heat, whether it is gas, flame or hot air; nevertheless, the drying is done by heat, is that right? A. Yes, but rotogravure printing is usually done on papers that are not coated papers like heat-set printing. The point I want to make is, that they are entirely different processes. They are inherently different. We have to use different drying equipment. We tried to use the same kind of heating equipment, in a similar thing, and it was wholly inadequate for the other.

(866) Q108. As I understand it, you said the letter-press ink used with the heat-set process differs from intaglio ink. In what way, can you tell me? A. No. I think an ink chemist ought to answer that question.

Q109. And therefore, you do not know, not being a chemist, what was in the first inks you received from I. P. I., do you? A. I don't know what was in those inks. I only know what they did for us and how they helped us solve our problems.

Q110. Now, the first inks you got from I. P. I. did not work very well, did they, on the presses? A. Well, they worked so well on Press 2 that we were willing to undertake a contract for a new magazine where we put ourselves —obligated ourselves to print 400,000 copies a week. I thought they worked very well.

Q111. Now I have reference to the inks you received from I. P. I. as early as November, 1935, not those that you used later on Press No. 2. A. We did not get any real chance to try out heat-set inks and give them a proper trial until we put in the I. P. I. experimental equipment on Press No. 2, when we gave it a real trial, and it was almost immediately successful.

Q112. When was that? A. I will have to check that date.

Q113. It was after, considerably after November, (867) 1935, however, wasn't it? A. I think it was immediately after November, 1935; that is, December, 1935, to early in 1936; that we were printing on Press No. 2 because it was the result of these tests that we made our plans looking toward Life Magazine's contract in the fall of 1936. I do know that the I. P. I. inks were considerably better than the early inks got from Levey.

Q114. Now, this equipment which I. P. I. helped you install was not effective at first, was it? A. It was quite effective.

Q115. You yourself made many experiments and improvements on the heater after that, didn't you? A. Not on that heater. That equipment and that heater are still intact, almost the way we used it. We did develop heat equipment of our own design on subsequent press installations, so that we have done a lot of improving of heating equipment. We have worked out a lot of improvements ourselves on subsequent equipment, and we bought new presses.

But Press 2 is a press that is almost forty years old, and as the result of this heating equipment we put on it, it has been a very productive and very useful press. It is the oldest press in the house today.

Q116. So what it was necessary for you to do to make this one process effective by that Press No. 2 was (868) merely to add a heater; is that right? A. We may have

worked out some mechanical changes for the web leads, I am not sure of that.

Q117. That was the principal change? A. That was the biggest thing we did.

Q118. Was that a gas flame heater? A. It was a gas heater, yes, sir.

Q119. How hot do those heaters run, around 1500 to 1700° F., don't they? A. My engineers tell me that they run around 1500 to 1700 degrees, Selas Heaters do.

Q120. The gas flame is right next to the web; is that right? A. Yes—no, that is not right. The Selas Heater itself produces an intense heat, and a flame blows on the web and burns off the vehicle and the fumes; but most of those heaters, it is not a flame that creates the drying.

Q121. As your presses start up cold, the rollers gradually increase in temperature owing to the tack of the ink and friction, do they not? A. Yes, the rollers and the ink carriages warm up as we use the press.

Q122. How hot do they get, do you have any idea? A. No, I do not know, I am sorry. That would depend on the temperature in the room. If the room was 100° F., the rollers might go up to 120 or 130° F.

Q123. In the summer, then, they would run much higher (869) than that? A. No, I don't think so.

Q124. Now, did you ever have any trouble with the ink rollers cracking, with the first I. P. I. ink that you used? A. I don't know about that.

Q125. Do you know what those ink rollers are composed of? Are they glue and glycerine, or rubber, or what are they? A. Well, we use various kinds of rollers.

Q126. When you spray the ink rollers, what is in the spray, do you know? A. Well, I know that we used to shut down and if we had trouble of drying, we would spray a little kerosene on. I don't know what we are using now.

Q127. Have you ever had any trouble with the web sticking to the rollers and wrapping around them and

causing a shutdown to clean them out? A. You mean a web break?

Q128. Yes; owing to sticky rollers. A. Well, the web does not come in contact with the rollers. The web only comes in contact with the printing face and the impression cylinder. The web never comes near the rollers.

If you are talking about——

Q129. All right. Sticky printing plates sometimes cause the web to break and tear, do they not? A. I do not think we have had any serious trouble like that.

(870) Q130. When you do, you simply spray the plate and that causes the plates to become less sticky; don't you use a Flit gun for that purpose? A. Well, if we get a web break, we stop and wipe up the press, which takes about fifteen minutes, and then we might after that wash up the press.

Q131. I see. That is to get off the gummy ink that has dried in the meantime? A. Yes. If we are only down for a few minutes, we spray the plates so the ink won't dry.

Q132. When did you begin printing commercially with heat-set ink? A. Early in 1936, we printed commercially on Press 2 with heat-set ink. I have not got the exact date.

Q133. I understand you were handed a subpoena before you testified? A. Yes, I was.

Q134. You would have testified as freely as you have without a subpoena, would you not? A. No, I would not without a subpoena. My reason for that is, I do not believe the differences between ink companies was any of my official business.

I do not see why I should, of my own free will, without a subpoena, enter into this case.

Q135. So you asked for a subpoena, did you not? A. I did not ask for a subpoena, no, sir.

(871) Mr. Watson: That is everything on the Busby deposition.

Mr. Free: As to this whole deposition I would like to note my objection on the record again, that the ink has not been connected up, and since it has not been and if it is not, then it is entirely immaterial.

The Court: Certainly the inks that have been introduced here are what are known as the heat-dried inks, and this deposition is confined solely to how they act under actual printing conditions, so I think I will overrule the objection.

Mr. Free: I would also like to note that Mr. Busby's deposition seems to be directed entirely to the process, and the process is expressly excluded in the patent in suit, which is confined to the ink.

The Court: To the chemical composition?

Mr. Free: To the physical composition of the ink.

The Court: What do you say to that?

Mr. Watson: I do not think it is confined to the process at all. It is confined to what the ink does in the actual production. Here is an ink and what does it do?

The Court: Your patent does not say anything about what it will do.

(872) Mr. Watson: The patent gives a useful article. We are showing that it is useful, I mean, if it were not a useful article we would have no patent on it.

Mr. Free: The patent says here, so that it is plain to us, line 28 of the second column of page 2:

"This method of printing is not claimed herein as it forms the subject matter of my co-pending application," serial so and so, filed so and so. That makes it plain that this patent definitely is not a process patent but is directed solely to the ink, therefore any testimony having to do with the process is irrelevant and immaterial because it relates to the

second application, which is here named as a separate invention.

Mr. Watson: If you will concede that the printing ink has revolutionized the typographic printing industry, we can dispense with all this sort of stuff.

Mr. Free: I won't concede that. The butyl carbitol in the patent in suit is a failure.

The Court: We will let it stand.

Mr. Free: At this time, however, to make the line of demarcation clear between the patent in suit and this application that this patentee refers to, I would like to offer in evidence as Defendant's Exhibit M-2 the certified copy of the file wrapper of the (873) application Serial No. 15,944, filed April 12, 1935, referred to in line 30, column 2, page 2 of the patent in suit.

(Marked Defendant's Exhibit M-2.)

The Court: All right.

Mr. Free: This application, your Honor, was obtained by the plaintiff here, and the subject matter is now public property as of December 29, 1940, as appears on page 40 of this Exhibit M-2, which also makes it plain that the process is no longer property of the plaintiff here.

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(874) Deposition read in evidence of LEONARD R. HECKER produced as a witness for plaintiff, who, being first duly sworn, deposed and said:

Direct examination by Mr. Watson:

Q1. Where do you reside, Mr. Hecker? A. 215 Walnut Place, Chatham Village, Upper Darby, Pennsylvania.

Q2. What is your occupation? A. Superintendent of plants, Benjamin C. Betner Company.

Q3. And your office is located here? A. Main office is in Devon.

Q4. And that is where you exercise your duties? A. No, my duties—I mentioned plurally that is; plants—cover all the plants, that is, the one here in Devon, one in Strafford, which is just adjoining, one in James River, Richmond, Virginia, and the last one is Oklahoma City.

Q5. How long have you occupied that position? A. Well, in the full sense of the word, for the last fifteen months; to a limited extent, for the last eight years. In fact, it can't go back quite that far, either, because it happened as the plants were added on. Now, let's see when the first would be—about 1938; wouldn't go back eight years.

Q6. Previous to that what was your position? A. Superintendent of printing.

Q7. For the Benjamin C. Betner Company? A. For the Benjamin C. Betner Company.

Q8. What is the business of Benjamin C. Betner Company? (875) A. Benjamin C. Betner Company is engaged in the manufacture of paper food containers. To bring it up to date, we use the terminology for Lend-Lease, Army and Navy, and domestic consumption.

Q9. What type of containers are those? That is, are they paper, tin, or cardboard? A. Paper.

Q10. Paper? A. Paper containers, yes. I thought I outlined that.

Q11. Would you mention some of the products for which you manufacture these containers? A. Well, the containers are used for dehydrated foods, flour, coffee, dried vegetables and frozen foods—let's see—shipping containers and liners for cartons.

Q12. Is the paper that you use for making these containers printed upon by you? A. Mostly it is printed, yes, majority of it.

Q13. What sort of process do you use for that printing? A. Well, we have aniline, rotogravure, high speed

rotary printing presses—do you want the name or the model?

Q14. Not necessarily, just the types. A. Just the general type—flat bed cylinder presses and job presses.

Q15. The high speed rotary press is the press which is used in what they call typographic printing. A. That is correct.

(876) Q16. What sort of inks do you use on those presses? A. The inks which we use on those machines are what we call heat reactive, and the particular trade name of the product we use is called Vaporin.

Q17. You purchase them from International Printing Ink Company? A. The ink is purchased from Interchemical, from I. P. I. I was going to enumerate our own converting, but I don't think that is necessary, probably. See, we do use those bases, too, and do our own color matching, but it is still the same basic formula.

Q18. I see. Are those inks that you have referred to as heat reactive stable on the press when the press is being run? A. Yes, they have proven to be very stable as far as general operation is concerned.

Q19. And do they dry immediately on the application of heat? A. Yes, they dry and are free of offset immediately upon the application of heat.

Q20. How long have you been using such inks? A. You don't realize, when you start to figure back—I think it was 1934 or '35.

Q21. Did you change from another type of ink when you adopted these heat reactive inks? A. Yes, we changed over from what was called linseed type inks at the time we made the conversion.

Q22. Why did you make that conversion? A. Conversion (877) was made to eliminate the use of slip sheet, primarily, which was an operation of interweaving a non-offset type of stock between each successive wrap, in the case of rolls, with the printed matter, and—well, you can

ask your next question, if you have one, I guess. There is no use of me telling a story.

Q23. The slip sheet was necessary in the case of linseed ink? A. Slip sheet was necessary in the case of linseed inks to make it possible to unwind the rolls after the inks had dried, and at the same time protect the surface of the ink during its drying interval.

Q24. Are those presses that you have referred to web presses? A. They are what are called rotary web presses.

Q25. That is, the paper is fed into the press in the form of a continuous ribbon? A. That is right.

Q26. Then what happens to it? A. It flows out after printing and is rewound on another spindle into a roll.

Q27. That is what they call the rewind roll? A. That is right.

Q28. In using this slip sheet, was that also a continuous ribbon of paper? A. That was also a continuous ribbon of paper.

Q29. And precisely how did it operate? Did it travel with the printed roll, or the printed web? A. It traveled from an auxiliary spindle and unwound from its own roll (878) and rewound into the freshly rewinding roll, which was the printing.

Q30. Does it travel on the printed side of the web, in contact with the printed side of the web? A. Well, it so happens that it don't matter.

Q31. It can be either way? A. Because—actually, it did, it did travel with the printed side, but it doesn't matter, because it is still a sheet of the stock, that is, the printed matter, on each side of the web.

Q32. What does it do, prevent the printed side of the web from coming in contact with the opposite, unprinted side? A. That is correct, yes.

Q33. Is this slip sheet a sort of a blotter, or is it an ink-repellent paper? A. It is an ink-repellent paper, and it took two general types. One was the wax impregnated

sheet, which resisted the action of the ink, and another version was the flint or garnet covered abrasive paper, which also resisted the contact of the ink.

Q34. Did the necessity for using such a slip sheet have disadvantages or not? A. It had considerable disadvantages. First, it induced an additional operation of rewinding the slip sheet into its separate roll and the printed matter into its separate roll after the ink had become dry. That meant additional equipment for the separating. It was an expensive operation, it resulted in (879) an inferior grade of printing, due to smudging, and had a slowing down effect on the output of the printing press, caused by the necessity of changing rolls oftener, due to the more rapid build-up of the finished diameter, caused by the two webs being brought together for rewinding.

I think they are the main points as far as the bad features of it are concerned.

Q35. And has your conversion to the heat reactive type of ink eliminated those disadvantages? A. The conversion to heat reactive type inks has eliminated all those disadvantages, with the additional feature that we have gotten an improved quality of work in the form of higher gloss and a more even gloss throughout the entire width of the sheet, which was not the case before, due to the inks drying faster along the edges of the web and slower in the center area. A lot of that comes back to me, now, thinking of it.

Q36. How long did it take the web printed with the linseed type inks to dry? A. The general practice was to leave the linseed printed rolls for twenty-four to thirty-six hours before rewinding, and another few hours before it was actually converted after rewinding.

Q37. What do you mean by "converted"? A. Converting is interpreted as meaning the conversion process wherein (880) the roll of paper is placed on a converting machine—in this case a bag machine—and cut off into individual units or impressions, and formed into bags.

Q38. Are these heat reactive inks used on the same presses that you previously used for the linseed type ink? A. Yes, they are used on the same machine.

Q39. Did you make any change in those presses to permit you to use the heat type inks? A. There was no changes made in the press itself to use the heat drying inks.

Q40. Did you use any equipment for drying them, heaters? A. The drying equipment was installed for the drying operation.

Q41. Nothing else was done to the press? A. No.

Q42. Except, of course, you could eliminate the spindle for the slip sheet, right? A. Well, that was—we just don't use it any more. They are around.

Q43. Would you say that the change to the use of heat type inks has resulted in an economy to your company as printers? A. Yes, it has resulted in economy, effected a saving all along the line, labor and materials, particularly.

Cross examination by Mr. Free:

XQ44. When did you first hear of heat reactive or heat-set inks that you have been talking about? A. The (881) best date I can give you on that, due to the fact of the lapse of years, is that it was in the early 1930's, I don't know exactly the year, now—possibly in about 1932.

XQ45. And what was the source of that information? Did some salesman call on you to sell you or attempt to sell you heat-set inks? A. The source of that information was, I believe, Mr. Cray, of Cray-Finne Company.

XQ46. Any other callers in respect to heat-set ink, for instance, from the Levey Company, about that same time? A. I had no direct contact with or any other information from Levey Company at that time. I don't know anything more than that, don't know any details involved. There was rumors of various things, I don't know just what year, I don't know whether it was before that or afterwards—it must have been afterwards.

XQ47. And you probably heard of the printing done by Curtis Publishing Company with Levey ink at that time, which was of this same heat reactive type, is that right? A. No, the first knowledge I had of Curtis Company was after we were actually operating here. The only knowledge I had previously of Curtis was that they were using a tympan offset sheet.

XQ48. What solvent is used in these inks you have (882) been talking about, heat-set inks? A. Well, I wouldn't say I would be qualified to actually say that, as to what solvent is. The ink comes to us already formulated, and I have nothing to base an actual statement on.

XQ49. But you do know that there was a change in the solvent from time to time? A. There may have been. I have no way of actually knowing that.

XQ50. For instance, you could tell that by the smell of the ink, could you not? A. The inks generally have been fairly free of odor, as far as any pungent odor is concerned.

XQ51. Do you have a hood for drawing off the fumes— A. Yes.

XQ52. —after the heater? A. Yes, we do have, the heater itself is designed with an exhaust system built in, which would account for some of our lack of definite knowledge on whether there was any change in the smell.

XQ53. You use the same kind of a hood, substantially the same kind of a hood, on the heat reactive presses as you do on the rotogravure presses, do you not, for drawing off the vapors after the heater? A. No, it is slightly different, that is, different from the generally accepted gravure hood, which, if my memory serves me completely, is more of an over-all canopy effect, whereas (883) on the driers which we operate, the web passes through a chamber which has exhaust ducts built right in, as well as the heat ducts for blasting the sheet with the heat, and those exhaust ducts are piped to an exhaust to the outside of the building.

XQ54. You have never detected any odor that could compare to a kerosene odor in connection with your heat reactive inks, have you? A. Not to the best of my knowledge. That would be a pretty hard question to answer, however, because we have quite a bit of kerosene around our press room at all times, and whether there would be a possibility of intermixing a smell of that nature would be hard to determine.

XQ55. Some of your food wrappers are necessarily printed with an odorless ink to preclude after-odor, are they not? A. That is right.

XQ56. Is there an odor at all to the inks that are used, heat-set inks that are used for printing the food wrappers, after printing? A. Nothing that would be objectionable, from our experience with the customers and the ultimate use of the containers.

XQ57. What is that odor, although faint? Can you describe it? A. The only way you could describe it would be to interpret it as sort of having a resin odor to it.

(884) XQ58. I understood you to say, did I not, that you operated rotogravure presses also? A. That is right.

XQ59. And there the web is a continuous ribbon? A. That is correct.

XQ60. And the ink is applied to the web? A. Ink is applied direct to the web.

XQ61. And then the solvent is driven off by heat, usually hot air? A. That is correct.

XQ62. How about the quality between your rotogravure printing and your heat-set printing? Can you compare those? A. Well, we can't compare it except from the printer's point of view, which would be that the rotogravure in our case is a simplified operation, it isn't on a par with our heat reactive letterpress printing. The rotogravure which we conduct is a simplified, two-color operation, and no processing of colors worked out, or anything of that nature, whereas on our heat reactive letterpress

set-up, we have set up and already have produced a high quality type of letterpress printing, embodying process, half tones, and so forth.

XQ63. The speeds of output, that is, feet per minute are about the same, are they not, for your rotogravure and heat reactive printing processes? A. Well, in our case, our heat reactive type printing is faster than our rotogravure. That would not necessarily (885) be true in all cases, however.

XQ64. There is no limitation on speed on your rotogravure press, however? A. There is on the machine we have.

XQ65. But that has nothing to do with the drying capacity of the ink, for example, it is a limitation of the press, as I understand it. A. No, as a matter of fact, in our case it is a limitation on the drying equipment. The speed which we operate our gravure press is balanced out with the amount of space we have available for the action of the heat on the gravure ink, and limits us to a definite speed, which is below our letterpress printing.

XQ66. What degree of heat do you use in your rotogravure presses, approximately? A. Approximately 200 degrees Fahrenheit.

XQ67. And what degree of heat do you use in your heat-set presses, approximately? A. 275 degrees Fahrenheit.

XQ68. Is that a gas flame or steam drum? A. That temperature is obtained by the use of a gas flame.

XQ69. In both instances? A. Not directly applied to the paper itself, or the ink, but to generating hot air.

XQ70. And that in each case is blown on the web? (886) A. That is blown on the web. There is one additional feature, which I have lost contact on for the moment, and that is, we do have one printing press in Oklahoma City, in which we direct the actual gas flame against the printed web.

XQ71. When you first obtained your heat reactive inks in 1934 or '35 you had a little difficulty with them in so far as stability was concerned, did you not? A. Only in the sense of obtaining a superior—cross that out, I will start over again. Will you ask the question again?

Mr. Free: Read that question back to him.

XQ72. And you started your answer with, only in so far as— A. Only in so far as the desire on our part to obtain a result showing a definite and positive improvement over any of our previously used linseed type inks, in the nature of gloss and sharpness of print, and so forth.

XQ73. And that lack of stability was corrected in later inks that you obtained from I. P. I., was it not? A. We didn't actually look upon it as a lack of stability as much as a desire to have available something superior to anything that we used before. Actually, by comparison, they were very nearly matched in the early stages, it was only on the desire on (887) our part to obtain something superior to anything that we had ever had that we requested development.

XQ74. How does stability or lack of stability manifest itself on a press? A. Well, the general consensus of a lack of stability on a printing ink on a printing press would take some simplified form, such as easy distribution, non-drying, or setting on the rollers while the printing press was running, and what is known as printability or sharpness of the impression.

XQ75. Now, in reference to the tendency to dry on the rollers, that was one of the difficulties with the first heat-set inks you obtained, was it not? A. We didn't seem to have any trouble along that line, possibly due to the high speed operation of the printing equipment. It was used on our so-called high speed rotary presses right from the start.

XQ76. The reason I asked that question is that Vaporin inks have changed since they first came out, and now con-

tain a solvent which does not tend to evaporate as rapidly as the original inks, and my understanding is that prior to the change there was some lack of stability. The change took place about 1936. Does that accord with your recollection? A. I haven't anything to base a conclusion of that nature on.

XQ79. How fast do you run your presses? A. Our (888) presses run upward of three hundred feet a minute.

XQ80. And after an hour of operation or so your ink rolls become pretty hot, due to friction and tack, do they not? A. Slightly warm to body temperature.

XQ81. About what temperature would that be? A. We have never actually taken a temperature reading of that and therefore I couldn't give you any actual figure on it.

XQ82. Thirty or forty degrees above room temperature, for example? A. It may reach a temperature as high as that.

XQ83. What sort of rolls do you use on your presses, composition or rubber? A. We use composition and synthetic rubber.

XQ84. Did you ever have any trouble with the composition rollers when you first tried the Vaporin ink? A. No.

XQ85. No cracking, due to drying out? A. No.

XQ86. How long would the composition rollers last with Vaporin ink? A. That figure was quite flexible, due to some equipment running twenty-four hours a day, and other equipment only running eight and nine hours, and there was an effect created there of shortening down the life of the surface of the roller by more constant operation, but in all cases it seemed to just about balance (889) out with what we had used in the—balance out with the life that we had accomplished or achieved when using linseed inks.

XQ87. What rollers did you have on the presses when you first started out with Vaporin inks? Were they composition or synthetic rubber? A. Mostly composition.

XQ88. Never had any trouble with drying out? A. Nothing any different than we did with our linseed inks, where we would have a dead area on the end of the roller which would cause the ink to set up.

XQ89. What sort of composition were those rollers, do you know? A. Well, there was the so-called glue, glycerin and molasses composition.

XQ90. That would mean to me that you did not begin using Vaporin ink until 1935, is that about right? A. What would that mean to you?

XQ91. Because the original Vaporin inks, as was acknowledged by the patentee in the suit, affected the glue and glycerin rollers by drying them out, so that when you tell me that you have had no difficulty with glue and glycerin rolls, that means you did not use the original ink. I think, therefore, that when you were in doubt as between 1934 and 1935, as having started, you most likely started in 1935, is that right? A. The (890) only way to get a positive date on that would be to check our records back and verify which year it was.

XQ94. Could you do that? A. That information may be available. I can look.

XQ95. Well, I wish you would, but in the meantime perhaps you would get someone started on it.

Mr. Free: It is stipulated that the first sale of Vaporin ink to your company was July 1, 1935, so you don't have to look up the records.

Mr. Watson: In the first week in July, 1935.

Mr. Free: All right.

The Witness: That was when we first went into it, productively, was it?

Mr. Watson: You have no objection to my showing him this?

Mr. Free: No.

The Witness: Yes, that is right, that was the job.

XQ96. About how much ink do you use a year or a month in these plants? A. Of all types?

XQ97. All types, yes. A. Somewheres in the neighborhood of about seven thousand pounds.

XQ98. A month? A. A month.

XQ99. And has the figure remained the same over the last five or six years, say? A. Let's see, that would (891) put us back to '38—yes, it would be about the same.

XQ100. Now, I wish you would divide that amount into percentages for the various kinds of ink, approximately. A. Well, let's see—I guess that figure is off about a thousand pounds. Will you allow me a correction there, of eight thousand?

XQ101. Sure, all I want is information.

Re-direct examination by Mr. Watson:

Q102. What should it be, eight thousand instead of seven? A. It should be about eight thousand pounds, yes, covering all types. About ninety per cent of that figure is the heat reactive type inks, and about three per cent in linseed types, and the other seven per cent would be in spirit inks, such as aniline and gravure.

Re-cross examination by Mr. Free:

XQ103. I think you said something about doing some color matching here of your own. A. That is right.

XQ104. How long have you been doing that? A. I think it was 1934, we started.

XQ105. And you buy the materials from what source? A. At the present time they are bought from Interchemical.

XQ106. Have you ever bought Vaporin type inks from any other source than Interchemical or I. P. I.? A. You mean the heat reactive type?

(892) XQ107. Yes. A. Yes, we have bought some from other sources.

XQ108. Who are they? A. Frederick H. Levey Company—that was the only other, come to think of it, I thought there were some others, but there weren't.

XQ109. How long ago was that? A. Well, as recently as the last year.

Mr. Free: I would like to make the same objection to this Hecker deposition as before, your Honor, that it has not been connected up with the patent in suit and it is largely a process which is excluded by the patent in suit.

The Court: Very well. Objection noted.

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(893) Deposition read in evidence of EDMOND P. JOY, produced as a witness for plaintiff, who, being first duly sworn, deposed and said:

Direct examination by Mr. Watson:

Q1. State your name, please. A. Edmond Patrick Joy.

Q2. Where do you reside, Mr. Joy? A. 1258 Asbury Avenue, Winnetka, Illinois.

Q3. And what is your occupation? A. Printer.

Q4. With what company are you? A. The Regensteiner Corporation.

Q5. What is your position at this time? A. Plant Manager.

Q6. How long have you been so employed? A. Approximately seven years.

Q7. What printing is done by the Regensteiner Corporation? A. Well, we do a great variety of commercial work, both letter-press, offset, some publication printing, and some specialty work in the way of playing cards, and that sort of things.

Q8. What publications do you print? A. Well, we print Esquire Magazine practically in its entirety, and we print

part of Coronet Magazine, and handle the binding of same, and we have two or three small trade magazines that come out of Detroit. I do not recall the names of them.

Q9. What type of presses do you use in the printing? A. Well, we have a variety of presses: regular 2-color—(894) 1- and 2-color Miehle presses, and one- or two-color offset, and part of Esquire is printed with 2-color rotary presses.

Q10. Is that printing what is called letter-press printing, or typographic? A. Letter-press printing.

Q11. Letter-press and typographic are synonymous, aren't they? A. Yes, I would say so.

Q12. Do you use rotary web perfecting presses in your letter-press printing? A. We have one such unit, yes.

Q13. What sort of inks do you use in your letter-press printing? A. Well, by that do you mean whose inks, or generally——

Q14. No; the type of inks. A. The types of inks? Well, in our regular letter-press, or flat department we use regular linseed varnish base inks.

On our rotary press, practically everything we run through is from heat-set type of inks.

Q15. How long have you been using the heat-set type of inks? A. Let me see now. Since May of 1939, I believe.

Q16. In what printing do you use such inks? A. Well, in the main we use it in running 1- and 2-color work for Esquire Magazine; although we do have some custom work in the way of children's books that we run with those inks occasionally.

(895) Q17. What types of inks did you use for that kind of work before you adopted the heat-set inks? A. Well, that work was primarily printed on flat-bed presses, using linseed varnish base inks, 1- and 2-colors.

Q18. Why did you change over to heat-set inks? A. Well, it was more—a faster method of production, primarily, and enabled us to change the general manufacturing procedure, which resulted in decreased costs of production.

Q19. Is speed an important item in your printing? A. Yes, it is very important, and it is particularly important in a publication because it enables us to give the publisher later closing dates, which apparently are as important to them in offering their advertisers more extended periods of closing their ad; it allows the advertiser later closing dates.

In other words, they do not have to get their "copy" in so early to meet certain issues.

Q20. Is greater speed in printing an economy to you as a printer? A. Well, speed itself, simply as speed, I would not say results in economy. But the use of the type of inks we are using, which results in greater speed, enables us to print certain types of paper by the method we are now printing: formerly we had to print at much lower speeds, and it results in much saving to us.

(896) Q21. That does result in much saving to you? A. That is right.

Q22. Are the heat-set types of inks that you use stable on the press; that is, do they stay moist on the press? A. They stay moist for a certain period of time. Our experience has been that the amount or length of time of their stability is tied in pretty—mostly with the drying qualities. In other words, an ink which we say we could class successfully at 16,000 impressions an hour, would not remain open as long as one that flashed or dried at a lesser speed, at 10,000 impressions, and particular inks that we run we find will stay open for two to three hours.

In other words, we do not have to wash the press when we have an occasional shutdown.

Q23. When you say they stay open for two or three hours, does that mean a shutdown or during operations? A. Oh, as far as operation of the presses is concerned, they stay open indefinitely. Where we are concerned, we have to shut the press down occasionally to fix up any adjustments or make-ready, or change of plates, and that sort

of thing, and it is a benefit to us to have the work stay open, so we do not have to go in there and wash up the rollers, as I do not have anything to dry on the plates during these shutdown periods.

(897) If we are shut down for an extended period, say six or seven or eight hours, something of that kind, we naturally, of course, wash the press up.

Q24. Are these inks dried immediately on the application of heat? A. Yes. It is almost instantaneous.

Q25. They emerge from the press perfectly dry? A. Yes. The printed signatures come out perfectly dry, as we know them as being dry.

In other words, they can be handled immediately without danger of smudging or offsetting.

Q26. Do I understand you to say that you use a perfecting press in connection with these heat-set inks? A. Well, the press we run is a 4-unit 2-color press. In other words, it prints two colors on each side of the web and delivers folded signatures.

Q27. Could you use such a press in printing with the linseed varnish inks? A. You could use such a press, but you could not print the type of paper we print on it at the speeds we print.

Q28. Suppose you were going to print the type of paper you are now using; could you use linseed varnish inks on that? A. I know of no successful application of linseed varnish inks on coated paper where they are using rotary equipment.

Q29. What is the reason for that, Mr. Joy? A. Well, (898) coated papers are highly finished. They have a glazed surface on them. They are papers that have very little qualities of absorption, with the result that the ink lies up on top, and unless you have an ink that can be dried by some means, such as heat, as we use in these Flash-Dri inks, it does not set quick enough on the web so that you can fold the work as it is being delivered from the machine;

and you run into a lot of offset and that sort of thing, smudging.

As an example of that, with a different concern, a few years ago, we used to run so-called super-calendered sheets, which are the next grade down, we will say, on the coated sheets, as far as hardness of surface, and so forth, on rotary presses. But we were only able to run them at a third or a quarter of the speed you are able to get today by the use of these heat-set inks.

Q30. Is it necessary, with the use of these linseed varnish inks, to store the sheets for a period of time to permit the ink to become sufficiently dry for handling, such as folding? A. Well, in printing on flat-bed presses, it is, yes. It is, and the length of time will vary; but it is seldom that the sheets will be safely handled in less than four hours' time, and very often the time will run up to twenty-four or more.

Q31. Is there a delay between the time when one side (899) is printed and the other side is printed? A. Yes. When printing flat-bed with the regular linseed inks, you do have to wait until the ink sets. These types of inks, I am not very familiar with the chemistry of the thing. It seems to be more a question of evaporation and setting, and there is no time element involved there; there is a very distinct advantage in many types of being able to back your sheets immediately, or back them up, as we say, immediately after they are printed on the first side.

Q32. The phrase, "back the sheets up" means printing on the second side, doesn't it? A. Yes, to run them through on the reverse side.

Q33. Such printing as you described has been performed with flat-bed press, is that correct? A. Well, on that particular work, particular type that we are now running rotary, using heat-set inks, that was formerly printed on flat-bed presses.

Q34. I see. How long would it take to do that by flat-bed presses, what you can accomplish on that rotary press.

could you make a comparison on that? A. Well, fairly—yes, I could make a fairly accurate comparison. When we printed on a job with flat-bed presses, we were able to print twenty pages at a time, at approximately a rate of around 1,100 an hour. The way we are running (900) now on 2-color rotary, we print sixty-four pages at a time, at the rate of approximately—oh, no, around 7,000 an hour; and in addition to that the work which we formerly ran flat-bed had to be folded; whereas the work we run on the rotary comes out as folded signatures.

In other words, we will say, 20 pages at a thousand an hour; that is 20,000 pages an hour; and 64 pages at 7,000 an hour is how much? Figure it up; 448,000 pages, something like that.

Q35. Do you have the delay between the first and the second side printing and between printing and folding in the rotary with heat-set inks, such as you had with the flat-bed presses you have spoken about? A. No, there is no delay there because the rotary press is a perfecting press. In other words, you reverse the first side and immediately print on the reverse side and the signatures are delivered folded.

In other words, they are ready for binding as it comes from the press itself.

Q36. Has there always been a demand, so far as you know, for an ink that will dry immediately after being printed, or could be dried immediately after being printed, which would still be stable on the press? A. Well, as long as I have been in the printing business, which covers around twenty-four years, there has been such demand.

(901) One of the biggest headaches that all printers have had is getting away from offset, slip-sheeting, smudging, and that sort of thing.

There has been development in the flat-bed field. There was a time when we used to have to slip-sheet.

Q37. What do you mean by that, Mr. Joy? A. Well, when work was delivered, a sheet would come out on the

delivery end of the press, and a man would have to stand over there and throw a blank sheet in between this and the one which follows it, in order to prevent one sheet from offsetting onto the other. Then some developments were made in inks so they could be dried partially with the application of heat, and gas burners were put on the presses.

Then came along a few years ago the so-called anti-offset sprays. Moisture and vapor and spray were applied to wet print, which more or less provided a cushion between that and the next blank sheet being delivered on top of it, to prevent offset.

Q38. I think you also used the term "smudging". A. Smudging and slip-sheeting are the same thing.

Q39. I see. What have you to say with respect to the quality of the printing accomplished through heat-set inks, as compared with what is accomplished by the old linseed varnish inks? A. Well, I can only give you my (902) own personal observation on it.

Q40. That is all right. A. When we first considered the use of the heat-set inks, we were somewhat dubious as to whether or not we could get as good a quality of work, and even prior to the time we bought our equipment we went into the matter as thoroughly as we could and had tests made on the type of papers we intended running, and so forth, and we were very agreeably surprised that the results were as good as they were, and they were perfectly satisfactory to our customer, then the publisher of Esquire, that we had to satisfy.

I suppose, generally speaking, you could say that from a strictly quality standpoint the results are not quite equal. But they are so close that the average reader of a publication; or the average layman picking up any piece of printing, I do not believe he would be able to distinguish between the two.

Now, on the credit side of the ledger for heat-set inks. Some distinct advantages are that you are able to run more

ink on the sheet, get more "guts" in your work. Prior to the development of these heat-set inks, in certain types of paper it is always necessary to skin your ink down, carry it down, and your printing was grey, comparatively speaking, because of the fact you were always running into offset trouble.

(903) The tendency has been to run more ink on to get more "guts" in your printing, or contrast. So I would say that the results are very comparable as far as quality is concerned, all elements considered.

Q41. From what sources have you obtained your heat-set inks? A. You mean by that who our suppliers are?

Q42. Yes. A. Well, we have run inks from a number of different suppliers at different times; but our regular suppliers are International Printing Ink and Eagle Printing Ink.

Q43. The heat-set inks you obtained from International Printing Ink have been known as Vaporin inks? A. I believe that is their trade-name. That is how we refer to that type of ink.

Cross examination by Mr. Free:

Q45. Did you ever hear of heat-set inks prior to your use of them in 1938? A. I first became acquainted with them when they started publishing Life Magazine. I think it was the advent of Life in the publishing field that first aroused my personal interest and got us to thinking along those lines as far as our own production problems are concerned.

Q46. You had never heard of heat-set inks used in connection with shoe store work and book binding trade? A. No, I did not happen to be acquainted with them.

(904) Q47. Have you ever had any experience with rotogravure work? A. Yes, sir, some.

Q48. In that type of work, the usual rotogravure press has a doctor blade for wiping the surplus ink off the roll,

and then the ink is deposited on the web, and then hot air is blown on the web to dry the ink; isn't that so? A. Yes. It is an intaglio process where the ink is deposited in the wells of the cylinder, usually an etched copper cylinder, and the excess ink is scraped from the surface of the cylinder itself.

It has always been my understanding, however, that your rotogravure inks were highly volatile and dried principally by evaporation of the vehicle, or whatever carries the pigment or color.

Q49. How long ago was it that you saw a rotogravure press operate in the manner you just described? A. Well, I have seen rotogravure equipment running in various plants other than the one where I am employed, off and on over the years; I mean, when I have said "other plants", I suppose three or four times a year would be a fair average.

Q50. Do you understand it has not changed much over that period of time? A. My actual connection with a plant which operated rotogravure printing was just prior to the time I joined the Regensteiner Corporation, when I (905) worked for the W. F. Hall Printing Company of this city.

Q51. When was that? When did you leave Hall? A. Well, let's see. I have been down here seven years in February; it would make it 1935—it must be 1934.

Q52. Yes. And that rotogravure process we have been talking about has been in current use for, oh, say fifteen years anyway, hasn't it? A. Oh, I would think so, yes, at least. Now then, I think it has been longer than that. The firm I am now connected with was in the rotogravure business.

Q53. And, as I understand it, most of these rotogravure presses have a sort of a hood over them to draw those vapors that you described they give off, do they not? A. Yes, I believe they do, because the vapors are such that they are highly inflammable, and as a safety factor I think that they would take those fumes out against explosion and fires, and that sort of thing.

I do not set myself up as an expert on rotogravure. My only knowledge of it is general, as it is with a number of other processes in the printing business that I do not have a direct knowledge of.

Q54. Do you know anything about the composition of the heat-set inks you have been buying since 1938; do you know what is in them? A. Only in a general way. When I say that I know in a general way, it is really more (906) information that has been given to me by different people in the ink business than any specific knowledge that I personally have.

I am not a chemist; I have never taken any of it and analyzed it; but my understanding of the inks, generally speaking, is that the main difference between the heat-set inks and so-called regular linseed base inks is that the change has been made primarily in the vehicle.

In other words, different solvents which are dissipated by heat have been substituted to carry the pigments, which is color in the ink, rather than an oil base, as was usually the case in linseed varnish inks.

Q55. And in your plant on this one heat-set press you have described, do you also have a hood that carries its vapors off? A. Yes, we have an exhaust system in connection with the dryers which carry off vapors.

Q56. Can you describe the odor of those vapors? Did you ever notice how they smell? A. Well, I would say they smell about like any other burnt oil.

Q57. A kerosene odor, sort of? A. To a degree, yes.

Q58. Now as to the roller on your heat-set press; have you ever had any difficulty with the rollers cracking or swelling, the ink rollers? A. It would not be any more so than on any other type of press.

Q59. You have, I presume, synthetic rubber rollers on (907) that press? A. Well, we use a number of different types of rollers. We use a synthetic base roller; we also use both synthetic and we used with a non-melt base roller which is coated with a so-called composition.

Q60. That is a so-called composition coated roller? A. This is a composition coated rather than a composition all the way through. We have also used some canvas rollers.

Q61. Now about speeds. I would like to get a comparison. Would you say that the heat-set press output speed is about equal or equal to that of the rotogravure press? A. It is my understanding that there is some rotogravure equipment which runs at speeds in excess of any presses that I happen personally to know about that are running heat-set, although on some of the newer presses during the last year or two they have stepped the speed up considerably in the letter-press field, where we are using heat-set inks.

It has been more a question of—I believe, of being able to build presses that would stand up under the speeds than it has been able to dry the inks.

Q62. How about heat generated by friction and tack of the ink; that is a problem which increases with speed of the presses, isn't it? Don't your ink rollers sometimes get pretty hot? A. We have never noticed that our rollers got hot to the point where they caused us any (908) trouble because of these increased speeds.

Our particular press, we did have one press unit where we used to do some running of coated rollers, but it was more because of the construction of the press and its roller unit was adjacent to one of the dryers or heaters on the press and caused us some trouble during the hot weather.

Q63. How do you heat your web after impressing it with the heat-set ink? A. By an application of gas flame.

Q64. Is the gas flame pretty close to the web? A. Yes. The heater itself has ribbons from which the flame emerges and are approximately an inch and a half or two inches away from the web.

Q65. Have you any idea how hot that heater is, how much heat is applied to the paper? A. Well, in the neighborhood of 1350 degrees Fahrenheit.

Q66. So that if your web should stop with the heat on, it might burn? A. Well, it would very definitely burn unless there were devices in the heaters that would cool them. As I say, occasionally those things get out of order, of course, and you get a severed web as a result.

Q67. So the web is pretty hot when it leaves the heater, and that makes it necessary sometimes to cool the web, doesn't it? A. The web is then run over a cold water roller, yes, sir.

(909) Q68. But for that the ink would be sticky? A. No, we have not found that to be the case. My own observation has been that the ink is just about as well set on the web after it leaves the heater itself as it is after it goes over that cold water roller; but the cold water rolls had put a certain amount of humidity back in the paper and makes us less trouble and makes your web less apt to break.

I do know that there are other inks being developed that they are setting by running them over cold water rollers, running under heated rolls.

Q69. The reason I asked the question was, I understood from another printer that the resins that are used in these inks are also softened by the heat, and that even after the solvent is driven off you have to cool down the remaining resin in the ink so that it will in turn harden. Does that sound reasonable to you? A. Well, I think possibly it has to be a combination of both to successfully dry it. I may have been—I may not have been absolutely correct in my first answer there because, when I think of it, I do know that we do get a slow accumulation of ink at times on the water drums, and we have to wash them off; so evidently the ink does not set to the same degree of hardness when it hits them as it leaves them.

(910) Q70. Have you any idea how cold those water drums are? Is it city water, or is it refrigerated? A. No, we use the regular city water from the city mains. It passes through this so-called—the cold water rollers, which are nothing but a hollow steel drum.

Q71. City water is around 40 degrees, 45 or 50; it depends upon the time of year? A. I don't know. I do know that we do not refrigerate it in any way before we run it through the presses.

Q72. Anyway, it is cold enough so that when the paper comes off those rollers, it is about room temperature, isn't it? A. No; I would say that the paper is slightly warmer when it is being delivered than it is at the time it is being fed into the press. Just how much, I am not able to answer that.

Mr. Free: I also want to object to this entire Joy deposition, on the ground that it has not been connected up with the ink of the patent in suit. He said he did not know anything about it, and it is largely directed to a process which is excluded by the patent in suit.

Mr. Watson: Is that overruled, your Honor?

The Court: Objection overruled. Are you sure it should be overruled.

Mr. Watson: Yes. I think I made an objection (911) to these metal progress magazines going in that he offered, and you overruled my objection, so the same applies to his.

We could finish up in ten minutes, your Honor, I think, by reading the balance of this Dennerlein deposition.

The Court: All right.

Extracts read in evidence from deposition of PETER DENNERLEIN, Manufacturing Director of Crowell-Collier Publishing Company (Extracts from this deposition previously read in evidence are printed at Record, pp. 235-238, 501-510).

Direct examination by Mr. Watson:

Q. What kind of presses do you use in the printing of the magazines at this time, Mr. Dennerlein? A. Well, we

use practically every type of letter-press equipment which is being used at the present time on publication work, and also a rotogravure high speed press.

Q. Letter press printing, as I understand it, is printing in which the characters are raised above the surface of your impression cylinder? A. That is correct.

(912) Q. Whereas gravure or rotogravure uses an impression cylinder in which the characters are below the printing surface? A. That is right.

Mr. Watson: Now on page 5, talking about the Vaporin or heat-set type inks, at line 21—that is the second question from the bottom of the page:

Q. Have they any particular advantages over the oil or varnish type ink? A. Oh, by all means, many advantages.

Q. What would you say they were? A. First of all of course they are conducive to a much higher quality of printing. Second, much higher speed. It is because of the introduction of the Vaporin or heat flash inks that the letter press field has been more or less revolutionized: They have enabled us to print black and black and one color both sides of the sheet three times faster than ever before, and also enabled us to print four colors on both sides of the sheet at one time or at the same time.

Q. And that is done on a perfecting press? A. A web perfecting press.

Q. I presume the word "web" there means a perfecting press which prints on a web of paper? A. Not necessarily, but it means you are starting with a roll of paper which goes through the press and it is cut into sheets, or folded, (913) and cut into sheets.

Q. That is at the delivery end of the press? A. At the delivery end; yes.

Q. Fed through the printing apparatus as a continuous roll of paper? A. As a continuous roll or ribbon of paper

Q. Is the typographic ink different in consistency from the gravure ink? You spoke of gravure ink as a thin liquid. A. Yes; the typographic ink is more or less a paste, and the reason for needing it in paste form is that the ink is being laid on top of or deposited on top of raised letters and raised half tone dots which are approximately two and a half or three thousandths of an inch higher than the surface of the plate, and if the ink was the same consistency as the gravure ink, why, it would simply flow off the dots and off the letters. Therefore it has to be a paste so it will stay on top of these raised surfaces.

Q. I have been told that it is somewhat of a trick—not a trick, but you have to be particularly careful about getting the proper amount of ink on the raised characters in letter press printing; is that correct? A. Well, that is true. Of course if you do not get enough ink on there, why, your impression is unsatisfactory—the print is not dark enough or legible, and if you get too much it (914) simply settles around the half tone dots and fills in between the letters.

Q. To control that they use a rather complicated series of rollers, do they not? A. Yes.

Q. How is the ink fed to the impression plate? A. Well, you first start from a trough of ink and you have a series of rollers which carry the ink to and finally deposit it on the printing plate, whereas in gravure the ink is sprayed against the cylinder and the ink is so liquid and thin that it settles into the various depressions, and the excess is wiped off the surface of the cylinder by what is known as a doctor blade, or a very thin steel knife. This knife simply scrapes the excess ink off the surface of the cylinder.

Q. You said that the inks used on the gravure type of press contains a volatile solvent: that is, a solvent which is more volatile than the solvent used in the typographic inks. A. There is a more volatile solvent in gravure ink because it requires no varnish at all and it is not exposed to air and doesn't go over a series of rollers.

(915) Q. I see. A. Therefore it is not exposed to the air at all and for that reason we can use a more highly volatile solvent in it.

Q. Is that prevention of exposure to the air accomplished through the device which has been known as the Weiss closed fountain? A. Yes. The closed fountain prevents the ink in the fountain from being exposed to the draught of the room. It is an entirely enclosed fountain. The enclosure fits right around the printing cylinder and ink in the trough or fountain underneath is kept flowing by a pump which takes the ink out of the fountain and brings it back and sprays it against the cylinder. It keeps on rotating all the time.

Q. You don't have the ink exposed to the atmosphere? A. Oh, no; it is sprayed inside of the fountain.

Q. As I understand it, the Weiss closed fountain permits the use of a much more volatile solvent than could be used before, when ink in the fountain was exposed to the atmosphere; is that right? A. That is right; yes.

Q. Is that Weiss closed fountain a recent development? A. I can't give you the exact time, but I would say about 10 or 12 years old. That is approximately right. I think it was about 1932 or previous—1930, or even 1928. Our first presses started here in 1935.

Q. It permitted the use of a faster drying gravure ink;
(916) is that right? A. Yes. We are able to run three times as fast. We can now run at a speed of 1200 feet a minute, which is pretty fast.

Q. How in your opinion does the advent of the heat flash inks for letter press printing compare with the introduction of the Weiss closed fountain for gravure printing or rotogravure printing? A. I didn't quite follow you on that. How does the vapor or heat flash type inks compare with the oil type?

Q. No. How does the effect of the introduction of "Vaporin" or heat flash ink for letter press printing compare with the introduction of the Weiss closed fountain

for rotogravure printing? A. I would say they have both done a similar job inasmuch as they allowed us or enabled us to run about three times as fast as we did before.

Q. In their respective fields? A. In their respective fields for printing; yes.

Q. Would it be possible to use a closed type fountain for letter press printing? A. Well, there is no use having a closed type fountain without inclosing also your printing ink rollers which carry the ink to the impression cylinder. That is where it is exposed to the air in drying.

Q. So closing the fountain would do no good in letter (917) press work? A. Would do no good in letter press without inclosing the rollers as well as your printing cylinder.

Q. You mentioned the paraffin wax spray, Mr. Dennerlein. I think it would be helpful to describe it to us, what it was and what it was supposed to do and what it accomplished: Let me say it is my understanding that it was used with the so-called old varnish type inks. A. That is correct.

Q. That is right? A. Yes. The old varnish type ink of course had the unfortunate fault of offsetting particularly in four colors, and for that reason we used this blotting paper in between each printed sheet. The paraffin wax is the common ordinary paraffin, melting at about 120 or 130 degrees. In the winter time we used around 120° and in the summer, 130 to 140° melting point, and we would stick that in a pot which was electrically heated and it would flow or come into a trough. In this trough were revolving wheels. Those wheels as they came around got in contact with a little nozzle. That nozzle would spray a mist of wax on top of each printed sheet. (918) This immediately eliminated the blotting paper. Those little particles of paraffin which dry of course as soon as they hit the sheet, would raise the surface just enough to allow that ink to more or less act as being dry. Of course, the ink was not dry. The paraffin simply acted as a sort of an

inlay to prevent that ink from smearing or offsetting on the succeeding sheet. In fact, we still have some of those.

Q. Was such a spray used with a web press—you say it was sprayed on the sheets? A. Yes.

Q. Does that mean sprayed on the sheets as they left the press? A. Yes.

Q. For instance you could not use it after the first side printing in a web perfecting press? A. No.

Q. Just on a sheet delivery press? A. Yes.

Q. As the sheets were delivered? A. And on one side only.

Q. On one side only? A. Yes.

Q. You would not use it on the second side? A. Not on the second side, no; you need spraying on only one side of the sheet, but you would use it every time you ran the sheet through the press.

Q. Would that permit you to increase the speed of the presses? A. Yes.

Q. Could you tell us how much? A. Yes, I would (918-A) say about 25%.

Q. About 25%? Yes.

Mr. Watson: The balance of this disposition, your Honor, was previously read.

Mr. Free: I make the same objection as to that, your Honor; no connection between the Dennerlein deposition and the ink of the patent in suit, and it involves a process excluded by the patent in suit.

The Court: The same ruling.

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(919) Mr. Byerly: I will call Mr. Bragdon.

Charles R. Bragdon, for Plaintiff—Direct.

CHARLES R. BRAGDON, recalled as a witness on behalf of the plaintiff, in rebuttal, having been previously sworn, testified further as follows:

Direct examination by Mr. Byerly:

Q. Mr. Bragdon, has your laboratory examined the so-called "Flash-Dri" inks of the Frederick H. Levey Company? A. Yes, we have.

Mr. Free: How is this material? Levey is not in suit here.

Mr. Byerly: Your Honor, I understand that yesterday afternoon there was an objection to some of our depositions regarding the use of these inks because the composition of the inks referred to by the witnesses who used them on presses had not been proved, and Mr. Watson stated that that would be connected up.

Mr. Free: This is a Levey Company. I think we ought to connect the Levey Company up with the plaintiff or with the defendant in some way before we go on to that company.

Mr. Byerly: It is merely for the purpose, your Honor, of showing that the inks to which this witness referred and which they said successfully dried, to show what the composition of these is.

(920) The Court: Were those inks put in here as exhibits?

Mr. Free: They are not even the plaintiff's inks, as I understand it. They are somebody else's.

The Court: Whose inks are they?

Mr. Byerly: These inks are made by the Levey Company, and several of the witnesses whose depositions were read were asked about these inks, I think, by Mr. Free, and they said that they worked satisfactorily. Now if they are totally different from the plaintiff's inks that would seem to indicate

that any kind of an ink will work. If they are identical in composition that shows that an ink of this sort of composition is required to do this, so it seems to me they directly bear on these depositions that were placed in evidence.

The Court: I will overrule the objection.

Mr. Byerly: Will you read the question?

Q. (Read.)

Q. What did you find as to these inks? A. We made complete analysis of them and found that the solvent is a petroleum hydrocarbon of the character similar to that used in the plaintiff's inks. It is about between butyl carbitol and the 502-C in its boiling range and in its vapor pressure.

Q. Did you find whether there was a resin dissolved in (921) this solvent? A. They contained resins dissolved in this solvent.

Q. There was reference in the depositions to inks supplied by the General Printing Ink Company. Has your laboratory examined those inks?

Mr. Free: Again, your Honor, we have to connect the defendant or the plaintiff with these inks we are talking about with the patent in suit.

The Court: What is the question?

Q. (Read.)

The Court: I do not think that is material. You cannot go into the whole market of all the inks and have him testify about that, unless the parties who make those inks have had something to do with this lawsuit or the issues connected therewithin.

Mr. Byerly: This is for the same purpose, your Honor, because they were brought up in cross examination of the witnesses as to the use of the inks, and we wish to show that the inks which they said could be used successfully were not something en-

tirely different but were substantially identical with the plaintiff's inks.

Mr. Free: Then it is immaterial. Let us talk about plaintiff's inks because this is rebuttal, and if Mr. Byerly wants to or can prove that plaintiff's inks (922) have anything to do with the patent in suit, that he may do; but not with Levey's inks or General's inks, which show no connection to the plaintiff or the defendant here, and that is what I am objecting to.

The Court: I will sustain your objection.

Mr. Byerly: Your Honor, I should like to note on the record under the rules that the plaintiff offers to prove that——

The Court: Write out what you offer to prove and put it in the record.

Mr. Free: May we have this Levey testimony stricken on the same point?

The Court: No, there is more direct reference to the Levey than there was to this, as I recall the depositions.

Q. Mr. Bragdon, you are familiar with the expressions "distillation range" and "boiling range"? A. Yes, I am.

Q. What is the difference between them? A. Well, they are used interchangeably so far as I have ever known in reference to solvents.

Q. You referred and Mr. Taylor referred to the A. S. T. M. method of determining boiling ranges and distillation ranges, did you not? A. I did.

Q. Can you produce a publication of the A. S. T. M. describing this method? A. I have the A. S. T. M. 1942 (923) Book of Standards which gives a description of the distillation test for naphthas, kerosenes and similar materials.

Q. Is this the book to which you refer (handing to witness)? A. That is it. The method of test is referred to as method D86-40.

Q. What page of the book is that method described on? A. It is on pages 862 and 863. It begins on page 859.

Q. Does the description of the method make any reference to determining the end point of the distillation? A. It does.

Q. Will you read what it says about that? A. On page 863, the first paragraph in the second column, it says:

> "The end point is the maximum temperature observed on the distillation thermometer and is usually reached after the bottom of the flask has become dry."
>
> The Court: Is that when it evaporates out?
>
> The Witness: Yes, your Honor. Everything except what is present in the form of vapor in the distillation flask, which usually is condensed again after the heat is taken off.

Q. I call your attention to Defendant's Exhibit B-1 which, as I understand it, indicates some distillation (924) ranges or boiling ranges which Mr. Taylor purported to have determined by the A. S. T. M. method. Do you find any note of the end points of those boiling ranges? A. The end points are not shown on this chart. The highest figure shown is at 95 per cent in each case—95 c.c. on a total of 100 c.c.

Q. Among the other lines on that chart, Defendant's Exhibit B-1, do you find one which purports to relate to Defendant's solvent 502-C? A. I do.

Q. I now show you Defendant's Exhibit LL which purports to show, under the heading "Sample H" a distillation range determined by the A. S. T. M. method of this same solvent 502-C made by Mr. Krawetz of the Phoenix Chemical Laboratory, Inc. Have you compared the boiling range given in Defendant's Exhibit LL with that given by Mr. Taylor on Defendant's Exhibit B-1? A. I have, and I find that there are a number of differences.

Q. Have you yourself determined the boiling range of defendant's 502-C using the sample furnished by defendant's counsel? A. I have. I find that the boiling range which we got by the A. S. T. M. method is very close to that given by Mr. Krawetz but is quite different from that shown by Mr. Taylor.

Q. Have you prepared a chart showing the difference (925) between the determinations made by you and the defendant's witness, Mr. Krawetz, and that made by Mr. Taylor? A. I have.

Q. Is that it (handing to witness)? A. It is this chart here.

Mr. Byerly: I offer in evidence the chart made by the witness as Plaintiff's Exhibit 45.

Mr. Free: You haven't said how you made it yet. I object to it until we know.

Mr. Byerly: Well, I will mark it for identification so that we can refer to it.

(Marked Plaintiff's Exhibit 45 for identification.)

Q. Just tell us what this Plaintiff's Exhibit 45 for identification is. A. Plaintiff's Exhibit 45 for identification shows in the upper line drawn in red the same curve as is shown on Taylor's Exhibit B-1—Defendant's Exhibit B-1. The two lines just below that are the boiling ranges as determined in our laboratories, and the line drawn through the points shown by Mr. Krawetz on Exhibit LL.

This is drawn on the same scale as the defendant's chart, and by placing the one over the other you can see that the Taylor curve corresponds with the one shown on his chart. The other curves lie below that, indicating——

The Court: The vapor curve?

(926) The Witness: That is the boiling range curve. That shows the progressive increase of temperature as the sample is distilled from a boiling

flask into a condenser. The initial boiling point which we obtained was about 260 degrees as compared with Krawetz's 263. Mr. Taylor did not show the initial boiling point. At 5 per cent distilled all three curves are about the same, but from that point on Mr. Taylor's boiling point seems to rise rapidly, whereas the boiling points determined by Krawetz and in our laboratories are almost a horizontal line, or much nearer a horizontal line than shown by Mr. Taylor. The end point which we get is much lower than the end point shown by Mr. Taylor, or, that is, the 95 per cent point shown by Mr. Taylor.

Q. Then, if I understand it, Mr. Krawetz's determination which you have checked shows that the defendant's solvent has what we call a narrower boiling range than the determination given by Mr. Taylor? A. That is correct.

Mr. Byerly: I now offer in evidence the exhibit previously marked 45 for identification.

(Plaintiff's Exhibit 45 for identification received in evidence.)

Q. Did you check any other of the boiling range determinations given on Taylor's Exhibit B-1? A. I did, (927) one of those that we compared was the boiling range given for the I. P. I. petroleum solvent. We have not similar differences there.

The Court: How many degrees is he off?

The Witness: I think at one part of the curve he is about 10 degrees off.

Q. Have you prepared a graph indicating your determination of the boiling point of the I. P. I. solvent, a sample of which was given to the defendant, and Mr. Taylor's examination contained on Exhibit B-1?

Mr. Free: At this time it may be appropriate, your Honor, to ask whether the solvent he mentioned was the same solvent that Mr. Byerly gave him.

The Witness: It is. It was taken from the same can. The curve on this chart drawn in red is identical with the curve shown by the defendant.

The Court: That is, Taylor's curve?

The Witness: Taylor's curve. You place that over that curve. That shows Taylor's determination and this shows the determination in our laboratory, which shows a much nearer horizontal line than Mr. Taylor's.

The Court: Which do you think is correct?

The Witness: I think our determination is correct.

(928) The Court: You used the same methods?

The Witness: We used the same method.

The Court: Which of you is the most experienced in doing that?

Mr. Free: I think those are within the range of experimental error. Those things are never very accurate, right on the nose, of course. I think you can take your choice. They are both so close it does not make any difference to me.

Mr. Byerly: I would like to point out to your Honor that the chemist for the company who sold this oil and Mr. Bragdon have reached substantially the same results, and Mr. Taylor's is quite at variance, and we think they are wrong.

The Court: The chemist who sold it naturally would be an interested party. Anyway, he is not in court and he has not been examined.

Mr. Byerly: Yes, he gave a deposition, which has been placed in evidence.

The Court: What is his name?

Mr. Byerly: Krawetz. I now offer in evidence the chart referred to by the witness and ask that it be marked.

(Marked Plaintiff's Exhibit 46.)

(929) Q. Did you find any other curves that you checked on Mr. Taylor's Exhibit B-1 that were erroneous?

Mr. Free: Just a moment, I did not notice this Exhibit 46. This refers to an I. P. I. solvent and not ours, and Mr. Krawetz was the chemist who furnished our solvent. So the statement that has to do with Exhibit 46 I do not think is accurate, Mr. Byerly.

Mr. Byerly: I would like to make it entirely clear, that we find that the Krawetz determination put in by the defendant on the defendant's solvent was widely different from that of Mr. Taylor's. We checked that and found that Mr. Taylor was wrong on that, and then we checked some of his other lines. I think your Honor will find that one of the defendant's chemists agrees with Mr. Bragdon and the other does not, and that will be a matter for your Honor to determine.

The Court: What difference does it make?

Mr. Free: None whatever. The real issue is whether or not either of these solvents is anything like butyl carbitol, and the answer is no. The curves tell that.

Mr. Byerly: The reason for putting this curve in is this, that the butyl carbitol curve, as you can see from this Exhibit B-1, is almost a horizontal line, and these determinations made by Mr. Bragdon (930) are much more like that than these wiggly curves made by Mr. Taylor.

The Witness: You asked a question?

Q. (Read.) A. The curve that he shows for butyl carbitol acetate differs considerably from the curve that we obtained on a portion of the same sample that was given to Mr. Free. I have drawn a graph to show the comparison between our curve on that and the defendant's curve.

Q. Is this the chart to which you refer? A. It is. This can similarly be placed over the defendant's chart, showing the same comparison with his distillation range, and this dark line represents our determination, which you see is almost——

The Court: Of what material?

The Witness: Butyl carbitol acetate. It is another Carbide & Carbon Chemical's product related to butyl carbitol and this curve corresponds much more closely to the distillation ranges which are given by the Carbide & Carbon Chemicals Company.

Q. By this curve you mean the one that you determined? A. The one that I determined, yes.

Mr. Byerly: I now offer in evidence the chart just produced by the witness and ask that it be marked.

(Marked Plaintiff's Exhibit 47.)

Mr. Free: I would like to note on the record (931) that all this is immaterial anyway, because the patent does not mention anything about boiling ranges or distillation ranges. The question is vapor pressures, so this is immaterial.

Mr. Byerly: If the defendant wishes to withdraw Exhibit B-I, of course, it becomes immaterial.

Mr. Free: We did that because the distillation range was brought in by the plaintiff in its prima facie case.

The Court: I will admit it.

Charles R. Bragdon, for Plaintiff—Direct.

Q. Mr. Bragdon, there is on this Exhibit B-1 a curve marked "Kerosene 250° C. plus"——

The Court: Whose exhibit is that?

Mr. Byerly: Defendant's Exhibit B-1.

Q. —did you check Mr. Taylor's determination of this substance? A. We did not, the sample——

The Court: If you did not check it, why, that ends it. That is all he asked you, was whether you checked it. You say you did not?

The Witness: We did not have an opportunity to determine it.

The Court: I do not care anything about that. He asked you if you checked it and you said no. You answered it before.

Q. Did you receive from defendant a sample of this (932) kerosene fraction referred to in that curve? A. We did receive a sample, but it was only about an ounce of material, which was not enough to make the distillation test.

Q. How long have you been familiar with petroleum products, Mr. Bragdon? A. Since 1909 I have been running tests on various petroleum products.

Q. And that includes these A. S. T. M. boiling range tests? A. It does.

Q. Has there been any change in kerosene between 1922, when the Doughty patent was issued, and the present time?

Mr. Free: Do you know that? I think we have been all through this. He has got to show he has had experience in the petroleum industry to tell that, and he has not been qualified as to that.

Mr. Byerly: He said he has been determining these ranges for a great many years.

The Court: You can ask him some cross examination on that.

A. I have made a number of distillation tests on kerosene at various times, and I would say that there has been a change in kerosene since 1922.

The Court: In the composition of it, you mean?

The Witness: Not so much in the composition, your (933) Honor, as in the wideness of the boiling range.

The Court: Is kerosene different today from what it was in 1932?

The Witness: It is.

Q. What is the nature of the difference? A. The boiling range was much wider in 1922 than it is today.

The Court: Who makes kerosene, these big petroleum companies when they make gasoline?

The Witness: Practically every petroleum refiner in the country makes kerosene.

Q. I show you two pages from a book entitled "Petroleum", published in 1922, which was shown to the defendant's witness, Mr. Taylor, and ask you whether you can determine from what is stated in this book as regards typical sample of American kerosene, how that boiling range there referred to compares with the present-day kerosene? A. The typical American kerosene is shown here as having a percentage below 150 degrees Centigrade of 14.4, 150 to 270 degrees Centigrade 45.9, residue 39.7, which would indicate that that is the proportion of the kerosene boiling above 270 degrees, which is much higher than is the case of the American kerosenes now.

Mr. Byerly: I will offer in evidence this photostat of the pages of the book entitled "Petroleum" (934) shown to the witness.

(Marked Plaintiff's Exhibit 48.)

Q. Have you made up a kerosone comparable to some of those used in 1922, for instance the one mentioned in the book which I have shown you? A. I have.

Q. How did you make this? A. I made it by taking some of the present-day kerosene and adding higher boiling fractions of the same general character, so as to bring the end point up to about the limit shown by the government specifications in 1922.

Q. I call your attention to Plaintiff's Exhibits 34 and 35, containing the government specifications for kerosene. What is the end point permitted by those specifications? A. The end point given in the 1920 specification, Exhibit 34, for prime white kerosene is 625 degrees Fahrenheit. That means the final boiling point when the flask becomes dry is 625 degrees Fahrenheit. 625 degrees Fahrenheit is 330 degrees Centigrade. In this Exhibit No. 35 the statement is given, "7. Distillation. The end point shall not be higher than 625 degrees Fahrenheit." That is under "Kerosene".

Q. And that you say is equal to 330 degrees Centrigrade? A. It is.

Q. Did you determine the boiling or distillation range of the 1922 kerosene which you made up by the A. S. T. M. (935) method? A. I did.

Q. Does this paper I show you contain that boiling range? A. That is it.

Mr. Free: I want to object to this. This is immaterial. He is making up kerosene. He is not taking ordinary commercial kerosene. We do not know what he put in it, and what he gets when he gets through.

The Court: The objection is sustained.

Mr. Byerly: If your Honor pleases, it seems to me this is proper rebuttal to defendant's testimony, which purported to interpet the Doughty patent and misinterpreted it by taking a present-day kerosene rather than the type of kerosene available at the time the patent was issued, and it seems to me that

we have a right to show the difference and to point out what difference it would make in the exhibits which the defendant has put in, if they had used the 1922 kerosene instead.

The Court: He has already testified as to what his tests with the 1920 kerosene were.

Mr. Byerly: He is in the middle of that testimony now. He has produced the boiling range, and I am going to get him——

Mr. Free: This is the made up kerosene. I want to make that clear. This is not kerosene that is (936) gotten on the market. He took kerosene that he got on the market and added something to it. We do not know what it was, and it is not what the defendant did. I want to get that straight, too.

The Court: He has got to take the kind of kerosene required in the book there.

Mr. Free: That is right, and this is not it.

Mr. Byerly: I think all this argument is out of place. Mr. Free can cross examine on what the witness has done.

Mr. Free: This is immaterial.

The Court: I think it is immaterial.

Mr. Byerly: Your Honor will not let us pursue this?

The Court: What kind of kerosene are you referring to?

The Witness: I took a present-day kerosene and added to it higher boiling portions of the same type of petroleum as is used in making kerosene.

The Court: Made by whom? Kerosene made by whom?

The Witness: The bulk of the kerosene that I used was Socony Vacuum's product, and to that I added a fraction, a high boiling fraction made by the same company that makes the defendant's 502-C oil, and to make a smoother boiling range I also

added a portion of the same type of (937) petroleum product from the Atlantic Refining Company, which had a boiling range intermediate between the two.

The Court: You had an entirely different product then?

Mr. Free: If it was not kerosene we do not know what it was.

The Court: We do not know whether it was kerosene or not.

Mr. Byerly: If your Honor pleases, the situation is very simple. In 1922 there was much less demand for this heavy fuel oil than there is now, and consequently they took more material which they now sell as fuel oil and kept it in the kerosene; that is, they made a wider cut.

The Court: Who has testified to that here?

Mr. Free: No one, your Honor. This is counsel testifying. The Doughty patent is very specific. He says, "I do not want a solvent which boils higher than 300, and I take kerosene and I cut it off at 250." There he says definitely you have a cut of 50 degrees from 250 to 300. We showed by the Mellon Institute book that we used the same as 1922 ordinary American kerosene, in that it fitted those specifications. That is all we were called upon to do. And then Mr. Taylor bought some kerosene, ordinary kerosene, still like Doughty used, (938) and that turned out to be much the same thing. We did not fix up any kerosene. We bought it on the market, and it happened to have been the same as it was in 1922. This stuff he is talking about, it has gasoline in it. Heaven knows what is in it.

The Court: That is just something he made up.

Mr. Byerly: He made it up on the basis of these publications and government reports to be like the kerosene made in 1922, and we want your Honor to get a correct view of this patent. If you permit the

kerosene made today, which is different from that which the inventor had in mind——

The Court: He can take kerosene made in 1922 if he wants to, but he made up a concoction of his own; which we do not know what it was.

Mr. Byerly: He has explained what it was, and he cannot get 1922 kerosene unless he happens to have saved some, which is quite unlikely.

The Court: Has he got any formula, or can he get someone who made kerosene in 1922 and knows what it was, and compare it with this stuff he made up? Then we can have a basis to know whether he is correct or not.

Mr. Byerly: We can do that, but he has told how he has made it. He has produced his determination of the boiling range. The boiling range fits with what was stated (939) in the book which we showed your Honor, describing the typical 1922 kerosene. It also fits the government specifications. Now that is pretty definite proof.

The Court: The objection is sustained.

Q. Did you determine the vapor pressure of this kerosene to which you have referred as 1922 kerosene? A. I did.

Q. And you produce a chart showing the vapor pressure of this kerosene during evaporation at 150 degrees?

Mr. Free: This is the same line of questioning. This is not 1922 kerosene he is talking about.

The Court: We do not know whether this was 1922 kerosene or not that he is referring to here. It is just something that he made up out of his own mind for his own particular pleasure. I think this question comes within the ruling of the Court and will not be admitted. Do you know what 1922 kerosene was?

The Witness: I have distilled a number of samples of kerosene in 1922.

The Court: Is this concoction the 1922 kerosene?

The Court: It was of that general character.

The Court: Not specifically the same?

The Witness: Not specifically the same.

The Court: Then the objection will be sustained.

Mr. Byerly: I should like, under the rules, to (940) make an offer of proof of the boiling ranges and the vapor pressure of the kerosene about which the witness has testified, and I include in this offer of proof the witness's determination of the boiling range and the vapor pressure, and ask to have them marked for the purpose of identification.

The Court: Very well, as part of the offer of proof.

Offer of proof by Plaintiff.

(Marked Plaintiff's Exhibits 49 and 50 for identification.)

Mr. Byerly: As part of the offer of proof I offer chart showing the boiling range of the kerosene above 250 made by the witness, and the kerosene above 250 given by Mr. Taylor on Exhibit B-1 and ask that this exhibit be marked for identification.

(Marked Plaintiff's Exhibit 51 for identification:)

Mr. Byerly: I also include in this offer of proof by this witness that after he had made this kerosene, which he says is made in accordance with the specifications for 1922, he distilled this kerosene at 250 degrees Centigrade, in precisely the same way Mr. Taylor stated that he distilled the Pure Oil kerosene to obtain a fraction over 250 degrees, and that the boiling range and vapor pressure determination of Exhibits 50 and 51 for identification were made from the residue remaining after (941) distillation at 250 degrees.

The Court: Have you finished your offer of proof?

Mr. Byerly: Yes, your Honor.

By Mr. Byerly:

Q. I now call your attention to Defendant's Exhibit I-1. Defendant's Exhibit I-1 purports to give the vapor pressure of terpineol, does it not? A. It does.

Q. Have you checked this with Defendant's Exhibit J, the Brewer and Gardner article? A. Yes, I have.

Q. Do you find that Mr. Taylor's determination of the vapor pressure of terpineol at ordinary temperatures is the same as Brewer and Gardner? A. No, it differs from Brewer and Gardner's. Brewer and Gardner show for terpineol a higher vapor pressure at 20 degrees, about 6/100ths of a millimeter, whereas Taylor's curve is 4/100ths.

Q. I call your attention to a line on this chart marked "Kerosene fraction 270 plus". Could such a fraction have been obtained from the kind of kerosene which Mr. Taylor said he used? A. The fraction would have been only a trace of material. There was very slight residue left in the distillation flask, because the end point of the defendant's kerosene was 270 degrees Centigrade.

Q. Did you determine the distillation range of defendant's kerosene from the sample of the kerosene (942) received from the defendant; that is, before Mr. Taylor fractionated it? A. I did.

Q. Is this your determination of the boiling range of defendant's kerosene? A. That is it.

Mr. Byerly: I will offer that in evidence.

Mr. Free: May I ask which kerosene that was, Mr. Byerly?

Mr. Byerly: That was the sample you gave us in Cincinnati, which he afterwards fractionated. This is the sample of kerosene which he drew out of a tank somewhere and said he was going to use.

(Marked Plaintiff's Exhibit 52.)

The Court: We will take a ten-minute recess.

(Short recess.)

Q. Mr. Bragdon, have you compared the formulae contained on the formula cards, Defendant's Exhibits F-2, G-2, H-2, I-2, J-2, produced by Mr. Carroll, with the formula given in the McElroy patent at page 2, lines 16 to 27? A. I have.

Q. Have you written out a comparison showing the percentages of the ingredients in the ink vehicle, both in the Doughty patent and in the formulas produced by Mr. Carroll? A. Yes. The formulas show several differences. In the McElroy patent they have 79.8 of terpineol, 4.2 of rosin-oil and 16 of powdered Cumar to make up 100 parts. (943) The Carroll formula used in the red, yellow and black inks are 14.3 of terpineol, 28.6 of pale second run rosin-oil and 57.1 of Cumar P-25, which is entirely different from powdered Cumar. Cumar P-25 is a viscous liquid.

The Court: May I see that?

(Witness hands paper to Court.)

The Court: What is the Carroll formula?

The Witness: That is the formula shown on the defendant's exhibits figured in percentages of 100 parts.

The Court: This is for varnishes, isn't it? There is no coloring matter?

The Witness: That is correct. The coloring matter is afterward added, and in the blue there was additional rosin-oil and terpineol added so that it makes the proportions slightly different as shown at the bottom of the sheet (indicating).

Q. Now I show you the Cumar specification chart, which is marked for identification as Plaintiff's Exhibit 38, and

which is part of a catalog of the Barrett Company. Are you familiar with the Cumar resin manufactured by the Barrett Company? A. I am.

Q. Do you recognize this pamphlet containing this chart marked for identification as Plaintiff's Exhibit 38? A. I do.

(944) Q. Does it state the physical properties? A. Yes.

Q. Of these Cumar resins? A. It does.

Q. What does it say as to the Cumar P-25 referred to on Defendant's Exhibit F-2? A. It describes it as viscous.

Q. Could that resin be placed in the form of a powder as is specified in the Doughty patent? A. Not unless you would take it down considerably lower in temperature, to freeze it and then powder it.

Q. Are there any of the Cumar resins which could easily be placed in the powder specified by Doughty? A. Yes, a considerable number of them.

Q. Will you mention some of them? A. The W grade which is furnished in several different types: the V grade, the MH grade, the RH grade, the MS, the RS, SX, DX, EX and FX.

Q. Those grades to which you have referred are hard substances which can be powdered? A. That is right.

Q. Does this catalog specify the purpose for which the P grade referred to on Defendant's Exhibit F-2 is intended? A. The P grades which are described as plastic, low-melting resins, are said to have as uses adhesives, rubber, plastic compounds, waterproofing.

Mr. Byerly: I now offer in evidence a (945) comparison of formulas produced by the witness.

Mr. Free: I would like to note on the record that this comparison is merely for vehicles and not an ink. It is immaterial.

The Court: Objection overruled.

(Marked Plaintiff's Exhibit 53.)

Mr. Byerly: I offer in evidence the Barrett Company's catalog referred to by the witness and containing the chart previously marked Plaintiff's Exhibit 38 for identification.

The Clerk: Page 12 was marked 38 for identification. Is this the entire catalog you are offering?

Mr. Byerly: I think the entire catalog had better have a new number so as not to be confused with the testimony of the witness.

(Marked Plaintiff's Exhibit 54.)

Q. You said that Cumar resin P-25 could be powdered if it was frozen. Would it stay in powdered form when it was warmed up to room temperature after being frozen? A. It would resume its viscous liquid condition.

Q. You referred to the difference in the boiling ranges which you determined of certain of the solvents mentioned on Defendant's Exhibit B-1 and your own determinations. Have you prepared a chart showing your (946) own determinations of defendant's 502-C ink oil, the L.P.I. petroleum solvent mentioned on Defendant's Exhibit B-1, and butyl carbitol acetate? A. I have.

Q. This chart also contains a line referring to the fraction of your 1922 kerosene as to which evidence was excluded, does it not? A. It does.

Mr. Byerly: I offer in evidence the chart referred to by the witness with the exception of the line relating to kerosene, 250 degrees C. plus, and I should like to make an offer of proof to include that line.

(Marked Plaintiff's Exhibit 55.)

Q. I call your attention to Defendant's Exhibit Q purporting to relate to vapor pressure of certain solvents mentioned in the Lefferts and Stevens patent. The lines on this chart are marked nitro-benzole, oil of pennyroyal, oil of fennelseed, oil of sassafras, oil of cinnamon, oil of cassia

and oil of cloves. Are those substances aromatic compounds or open chain compounds? A. They are all aromatic compounds.

Q. Are they saturated compounds or unsaturated compounds? A. They are unsaturated except nitro-benzole.

Q. These various oils referred to, including oil of cassia, is there any general name for that character of substances? A. They are called essential oils. They are (947) derived from plants and they are mixtures of chemicals.

Q. What are they used for ordinarily? A. They are used for flavoring and perfumery generally.

Q. Did you some time ago determine the vapor pressure of oil of cassia? A. We did.

Q. From whom did you purchase this oil of cassia? A. We purchased it from Schimmel & Company in 1938.

Q. Tell me what the papers are that I now show you (handing to witness)? A. This is a voucher and an invoice for five pounds of oil of cassia rectified U.S.P. 11.

Q. Is that the oil of cassia on which you determined the vapor pressure? A. It is.

Q. And that was done in 1938 at the time of the invoice? A. Yes, sir.

Q. Did you find the vapor pressure of this oil of cassia the same as the vapor pressure given for oil of cassia on Mr. Taylor's chart, Defendant's Exhibit Q? A. No. We found a different range, different line for the vapor pressures. The vapor pressures we obtained were much higher than obtained by Mr. Taylor.

Q. Have you produced a chart showing the vapor pressures which you obtained on the oil of cassia which you bought in 1938 as compared with that of butyl carbitol as the butyl carbitol is shown on Defendant's Exhibit Q? (948) A. Yes. This is the chart. It shows the vapor pressure of oil of cassia at 20 degrees Centigrade is about .2 of a millimeter. Mr. Taylor's chart shows it as being less than that of butyl carbitol. The vapor pressure shown here is more than ten times as high as that of butyl carbitol at 20 degrees Centigrade.

Charles R. Bragdon, for Plaintiff—Direct.

Mr. Byerly: I will offer in evidence the chart produced by the witness.

(Marked Plaintiff's Exhibit 56.)

Q. Did you purchase some more oil of cassia during the present year? A. We did.

Q. How did you find the vapor pressure of that compared with the vapor pressure given by Mr. Taylor? A. It checks pretty closely with that given by Mr. Taylor.

Q. Have you ascertained whether or not the composition of oil of cassia is constant or variable over the years? A. It varies considerably according to all the information we have been able to obtain.

Q. Is that information in the nature of published data? A. It is. I have a publication here "The American Perfumer" which has an article by Dr. F. D. Dodge, the chief chemist of Dodge & Olcott, which describes the difficulty that has been experienced in the adulteration of oil of cassia coming from China, the interior of China, and various differences that have been found to (949) exist in various samples of oil.

Q. Does all oil of cassia come from China? A. It does.

Q. Does oil of cassia have any odor? A. It has quite a strong odor—the odor of cinnamon.

Q. Is a part of oil of cassia volatile at room temperature? A. A considerable part of oil of cassia is volatile at room temperature, and the odor is due partly to that volatile part.

The Court: Is the odor a result of the volatile part? When a thing is volatile it has an odor?

The Witness: That is correct.

The Court: Which smells in evaporation?

The Witness: That is true.

Q. Has your examination of oil of cassia been sufficient to enable you to say whether an ink made with a solvent of oil of cassia would produce any odor when spread out on the rolls of a printing press? A. It certainly would. The

test made by defendant's witness, Mr. Taylor, with an ink in which he had used oil of cassia caused the courtroom to be pretty well pervaded by that odor.

Q. And that was only a very small amount? A. It was a very small amount that he had spread out there. If the ink was spread out on a large surface, such as a traveling web and the rollers of a printing press, you (950) would have a very penetrating odor.

Q. Mr. Taylor suggested on page 535 of the minutes that toluol had about the same vapor pressure as water. Have you checked that to see how closely the vapor pressure of toluol is to that of water? A. It is a little higher, around 2 centimeters at room tempeature.

Q. Now you demonstrated in your *prima facie* ink, which you said had a vapor pressure of 1½ centimeters— A. Secondary butyl acetate.

Q. That was closer to water than the toluol suggested by Mr. Taylor, is that right? A. That is correct.

Q. Can you demonstrate the effect of differences in vapor pressure in the evaporation of thin films of liquid using secondary butyl acetaate, which you said had a vapor pressure of 1½ centimeters, the toluol suggested by Mr. Taylor which you said has a vapor pressure of about 2 centimeters, and ethyl alcohol which you previously stated has a vapor pressure of about 4 centimeters. Will you please tell us exactly what you do as you do it, Mr. Bragdon, so that the record will have it?

The Court: Read that question to me, Mr. Stenographer.

Question (read).

The Witness: Will you hand me the newspaper there? I do not want to spoil the finish.

(951) (Newspaper handed to witness by Mr. Byerly.)

Q. Just describe what you have here and what you are doing, Mr. Bragdon. A. I have here a small glass plate,

the surface of which has been ground to make a slightly roughened surface so that the liquids will spread more readily and so that their evaporation can be more easily followed.

I have a bottle of absolute alcohol, pure ethyl alcohol, and one of secondary butyl acetate.

By means of droppers I place two drops of each of these liquids at the top of the glass, and then with the edge of another smooth glass plate I draw them down so as to make a uniform thin film of each.

You can see the liquid by the dark areas. The one on the left is alcohol; the one on the right is the secondary butyl acetate.

The Court: What are you waiting for now, to see how quickly they dry?

The Witness: I am waiting now to see how quickly they evaporate.

The Court: The carbitol is evaporating.

The Witness: This is the alcohol (indicating). That is drying a little quicker.

The Court: This is drying a little quicker, isn't it—oh, no; it is a pretty tight race.

(952) Q. It is the alcohol that won by a small margin, isn't it? A. The alcohol won by a small margin.

The Court: The right one.

The Witness: I will say this disappeared first. I will try it again. It doesn't take but a minute to make the test.

(Demonstrating.)

Mr. Free: Which is which?

The Witness: This is the alcohol (indicating).

The Court: On the left.

The Witness: The alcohol is on my left.

Q. You are trying this the second time, Mr. Bragdon? A. I am trying this the second time.

The Court: The one on the right is going very fast.

The Witness: The one on the right was a little faster that time.

The Court: Much faster. The one on the left is still quite a big patch, isn't it?

The Witness: There is.

Mr. Free: Does the effect of the heat of your hand make any difference?

The Witness: We can reverse it. We can make the conditions just as you suggest. (Demonstrating.)

The Court: You have changed positions now? (953) Is the alcohol still on the left?

The Witness: The alcohol is still on the left but I will hold it this way (indicating), so as to place the alcohol on the right.

The Court: The one on the left suddenly starts up like greased lightning.

Mr. Free: The one on the right is dry, isn't it?

The Witness: There is still a slight darkness there. There again, they are close, as your Honor can see.

The Court: Well, the one on the right has not disappeared yet but the one on the left has completely.

Mr. Free: What was the one on the right?

The Witness: This was the alcohol.

The Court: The alcohol has just disappeared, hasn't it?

The Witness: Yes.

The Court: About 30 seconds difference, was it?

The Witness: I will try it once more.

Q. It has been suggested that you turn the glass around before dropping the liquid on so as to be sure there is no

difference in the two parts of the glass. A. I have it reversed now from the way it was before.

By the Court:

Q. Is that glass, as you cut it down taking some of (954) the material off and affecting it? A. It does take a little off. It leaves a uniform film of both liquids on there.

Q. So as to make it a fair test? A. So as to make it a fair test.

Q. Which is on the left now? A. On the left is alcohol.

Q. And on the right is what? A. On the right is the secondary butyl acetate.

(Demonstrating.)

Q. The butyl acetate has now disappeared and a good deal of the alcohol left, isn't there? A. There is. This is the alcohol (indicating).

Q. The secondary butyl acetate has disappeared quicker than the alcohol as a result of these tests, hasn't it? A. In these comparisons it has evaporated just a little faster than the alcohol.

By Mr. Byerly:

Q. Now will you try the toluol against one of the other liquids. A. I will compare the toluol in the same way against alcohol.

The Court: Why do you use that?

Mr. Byerly: That was the subject suggested by Mr. Taylor as having the same vapor pressure as water.

Mr. Free: At what temperature?

(955) Mr. Byerly: At room temperature.

(Witness demonstrates.)

Q. Which are you comparing now? A. The alcohol is on my left and the toluol is on my right.

The Court: The toluol is going faster, isn't it?

The Witness: It is going a little faster now. Toluol has a tendency to spread out a little more readily on the glass than the alcohol does.

It evaporated a little bit faster than the alcohol.

Mr. Free: While you have your apparatus set up I wonder if you would mind trying alcohol and water in the same way.

The Witness: If you will see that we will get an atmosphere without any humidity we will be glad to make that comparison.

Mr. Free: I wish you would try it right here and now.

Mr. Byerly: Your Honor, I think the results of that will certainly show nothing but that it was an obviously damp day. Of course, we will concede that water will evaporate more slowly—if that is what Mr. Free wishes.

The Court: This room is pretty well dried out, isn't it?

(956) Mr. Byerly: If you will look on the window you will see it is coated on the inside with moisture.

Mr. Free: I would like to try this, your Honor. This room isn't very damp.

The Court: Go ahead and try it.

Mr. Free: Let us see what happens.

The Court: State for the purposes of the record what conditions you are going to effect.

The Witness: The water will dry much more slowly in this atmosphere because its effective vapor pressure is very greatly reduced by the vapor pressure of the water that is already in the air.

The Court: It won't affect the absorption of the alcohol?

The Witness: No, because there is no appreciable amount of alcohol vapor in the air.

Mr. Free: I think it would be fairer to the alcohol if we got some room temperature water.

Mr. Byerly: The water seems pretty cold, doesn't it? Where are we going to get it?

Mr. Watson: Out of the thermos. That is the only water available.

The Court: Get some in my room.

(Water obtained from the Judge's room.)

(957) By Mr. Free:

Q. The bailiff has produced a glass of water from the ordinary water-tap. A. I will have to use my finger, I guess, to apply the drops.

Q. You are putting water on the— A. On my righthand side and the alcohol on the lefthand side.

Q. I wish you would time the alcohol evaporation rate. I have 25 minutes after 12 on my watch. A. The water volume seems to be considerably thicker there. Water has a very high surface tension, which means that it tends to draw together in drops.

The Court: The alcohol has disappeared now.

The Witness: The alcohol has disappeared now.

Mr. Free: The alcohol is all gone in 35 seconds.

The Court: And the water is still there. It has not begun to disappear.

Q. Did you try that experiment with water and alcohol after our session the other day, under dry conditions, Mr. Bragdon? A. We were not able to get the right conditions.

Q. You did not try it in a very dry, steam-heated room, for example? A. No.

Q. The water is still about as wet as it was? A. It is beginning to dry now.

(958) The Court: All right, let us get along. This is all very interesting.

Mr. Free: Let the record show that after almost two minutes the water is still pretty wet, isn't it?

The Witness: Yes.

By Mr. Byerly:

Q. In Exhibit 53 in which you compared the formula of the McElroy patent with the formula given by Mr. Carroll, you indicate that in Mr. Carroll's formulas the rosin-oil was nearly twice the amount of the terpineol, while in the formula of the patent the rosin-oil was only 5 per cent of the amount of the terpineol; is there a difference in the vapor pressure of terpineol and rosin-oil? A. Yes, the vapor pressure of rosin-oil is much lower.

Q. Have you prepared a chart showing the vapor pressures of terpineol and rosin-oil? A. I have; it shows that terpineol is very much more volatile than rosin-oil.

Mr. Byerly: I will offer this chart in evidence.

(Marked Plaintiff's Exhibit 57.)

Q. Can you tell us from this chart, Exhibit 57, whether there would be any difference between the vapor pressure of a solvent such as described in the McElroy patent, consisting of 95 per cent of terpineol and 5 (959) per cent of rosin-oil, from a solvent such as that shown in Mr. Carroll's formulas, consisting of 33 per cent of terpineol and 66 per cent of rosin-oil? A. The vapor pressure of the mixture in the Carroll ink would be lower than that of the McElroy patent.

Q. Appreciably lower? A. Appreciably lower, yes.

Q. Have you prepared an ink in accordance with the formula of the Doughty patent, containing 4 parts of terpineol, 1 part of rosin and 10 parts of bronze powder? A. Yes.

Mr. Byerly: I offer the ink produced by the witness.

(Marked Plaintiff's Exhibit 58.)

Q. Will you please open the box in which this ink is contained and show the Court the consistency and appearance of this ink.

The Court: What kind of ink is that?

The Witness: This is ink prepared in accordance with the formula given in the Doughty patent.

The Court: What is the solvent there?

The Witness: Terpineol. The pigment has settled down very hard in the bottom.

Q. Is that a peculiarity of the metallic pigment? A. It is if they are allowed to stand for some time. They are very heavy in specific gravity. You see, the (960) vehicle is very thin there.

The Court: What is the vehicle used for?

The Witness: That is the binder and the solvent.

The Court: What is the solvent?

The Witness: Terpineol.

The Court: It does not run, does it? That could not be used on a press in that shape, could it, in that condition?

The Witness: I think it could. It would be a little thin, if anything, for use on a press. After it is thoroughly mixed up it will become quite thin.

Q. That is, the vehicle of the ink is rather thin and you are now stirring the metallic powder? A. Stirring the metallic powder in, which makes it seem rather thick at present, but when it is fully stirred in it will thin down again.

Q. While you are mixing that, Mr. Bragdon, will you tell us whether terpineol is an aromatic compound or an open chain compound? A. It is an aromatic compound, unsaturated compound.

Q. You are getting that pretty well mixed. What would you say its consistency is? A. It is rather, I would say, on the thin side for a printing ink; a typographic printing ink.

Q. Do you know whether it is the right consistency for (961) use for stamping with a hot die? A. I would say it would be about right for that.

Mr. Byerly: I think perhaps that is sufficient, your Honor.

Q. Mr. Bragdon, have you prepared a statement of the ingredients of the ink given in the specific example of the Jirousek patent, showing the percentage of the different ingredients and the different classes of ingredients? A. I have, this is the statement.

Mr. Byerly: I offer this in evidence.

(Marked Plaintiff's Exhibit 59.)

Q. Your statement, Exhibit 59, shows the presence of a solvent consisting of three different ingredients, does it not? A. It does.

Q. How does the vapor pressure of that solvent at room temperature compare with that of butyl carbitol? A. It is about 200 times as high.

Q. Have you made any investigation in your laboratories as to the effect of adding a small amount of wax to a volatile solvent? A. We have.

Q. What did you find out? A. We find that the addition of paraffin wax lowers the vapor pressure very slightly, possibly 5 or 10 per cent.

Q. Does it have any effect on the evaporation? A. It does have an effect on the evaporation, particularly (962) if the solvent is allowed to remain quiet. As the first portions of the solvent evaporate a film of wax is formed on the surface, which slows up the evaporation, but if the liquid is kept in motion the effect is very slight.

Q. That is because— A. Because the skin of wax cannot form.

Q. In the demonstration which was made here by Mr. Taylor of a solvent with and without w[illegible]was that made under conditions in which a film of wax could rise and delay the evaporation? A. It was. The drops were placed on a sheet of paper and the evaporation was allowed to take

place without stirring it up, so that a film of wax could form on the surface and delay the evaporation.

Q. Would that occur on the ink feeding rollers of a printing press? A. Practically none at all, because the rollers would be moving so fast that the film of wax would not have a chance to form.

Q. Have you a sample of the ink vehicle described in the McElroy patent before the pigment is added to it? A. I have. This is it.

Q. What kind of Cumar resin did you use in making that up? A. We used a powdered Cumar resin as described in the patent.

Q. That ink vehicle is much more liquid than the (963) vehicles ordinarily used in typographic inks, is it not? A. It is.

Mr. Byerly: I will offer in evidence the ink vehicle of the McElroy patent produced by the witness.

(Marked Plaintiff's Exhibit 60.)

Mr. Byerly: That is all.

Cross examination by Mr. Free:

Q. Mr. Bragdon, I wish you would take your Plaintiff's Exhibit 45 and take your pencil and draw on it the distillation curve for butyl carbitol.

Mr. Byerly: Your Honor, I object to this. The butyl carbitol distillation curve is not criticized as a defendant's exhibit and I see no reason why it should be placed as our exhibit in criticism, which is for a different purpose.

The Court: Have him make it on a separate piece of paper.

Mr. Free: I want him to compare the two. It does not do any harm.

The Court: You cannot change someone else's exhibit.

Q. Will you draw a comparative curve on another piece of paper, between butyl carbitol and 502-C oil, any one of those curves shown on Exhibit 45.

Mr. Byerly: This Exhibit 45 is transparent. (964) Can you not make the comparison suggested by counsel by placing it over Defendant's Exhibit B-1, containing the boiling range of butyl carbitol?

The Witness: I can do that.

Mr. Free: I would rather have you draw it on a separate sheet, so we can see how they look. Roughly, you can place one over the other as you look.

Mr. Byerly: I think the witness should not be asked to copy one of their curves again. He has shown the comparison.

The Court: Well, let him do it.

Q. Take a piece of yellow paper. That will do all right, and mark the temperatures up one side and then just rough in two curves, will you? A. (Witness complies.)

Q. Now, will you mark the lower curve "butyl carbitol"? A. (Witness complies.)

Q. Now, on that same curve I wish you would place the curve marked "I. P. I. Solvent" on Plaintiff's Exhibit 46.

Mr. Byerly: Which of the curves?

Mr. Free: Either one.

A. (Witness complies.)

Mr. Free: I offer in evidence as Defendant's Exhibit R-2 the comparative curves between butyl carbitol, the plaintiff's solvent, and defendant's solvent.

(965) (Marked Defendant's Exhibit R-2.)

Q. Referring to Exhibit R-2, Mr. Bragdon, the I. P. I., or plaintiff's solvent, and the 502-C solvent are above butyl carbitol, are they not? A. They are.

Q. Quite a distance? A. It looks like quite a distance on that chart, because the chart is cut off at about 200 degrees Centigrade. Of course, if you started from 20 degrees Centigrade and ran it up to that point the difference would not appear so great.

Q. It is a difference of approximately 230 to 270, the first for butyl carbitol and the second for defendant's and plaintiff's solvents, is that right? A. That is correct.

Q. The oil of cassia, which you said you obtained, contains some adulteration, as I understand it? A. We got it from the most reliable supplier that we could, and we assumed that it was pure oil of cassia, as pure as oil of cassia can be obtained. There is a wide difference in the percentage of cinnamic aldehyde.

Q. It was not U. S. P.? A. Yes.

Q. But U. S. P. specifications prohibit adulterations, do they not? A. They do not prescribe definitely how any adulteration is to be determined. They merely give certain tests which are intended to describe a pure oil, but apparently a good many pure oils and some adulterated (966) oils might come under the same specification. The books on essential oils state that some oils of cassia containing as little as 40 per cent of cinnamic aldehyde have been received, which apparently so far as could be determined were still pure oils of cassia.

Q. I would like to know whether you agree with this statement:

> "A mixture of nitrocellulose solvents and wax solvents and containing a proportion of wax very slight with respect to the total amount of the composition but sufficient to substantially prevent evaporation at, say, 70 degrees F., while not materially preventing evaporation at temperatures somewhat above 100 degrees F."

Has that been your experience with wax in solvents? A. If the film is allowed to remain quiet it takes very little wax to prevent evaporation.

Q. A very small percentage would do that job all right? A. Yes.

Q. A thin film of ink is always spread on the type, isn't it, in printing? A. It is.

Q. And the wax would retard evaporation under those conditions? A. I do not think it would have a change to retard it, not in high-speed printing.

Q. But it does retard evaporation, the wax does? (967) A. The film where the wax is allowed to form a skin on the top.

Q. How did you determine the vapor pressure of the oil of cassia which you tested? A. We determined that in an apparatus similar to the one which you saw.

Q. That was not a Brewer and Gardner apparatus? A. No, it was not.

Q. And it is the Brewer and Gardner apparatus in which butyl carbitol was measured in accordance with the patent in suit, wasn't it? A. The patent mentions the Brewer and Gardner determinations as having been published.

Q. And so your oil of cassia determinations were obtained by different apparatus than the vapor pressure curves were obtained in the patent in suit, that is right, isn't it? A. They were obtained by an apparatus which we believe to be much more accurate than the Brewer and Gardner apparatus.

Q. But different method? A. Different.

Q. You mentioned the Doughty patent, and I ask you whether you noted at line 50 on the firsf column, page one, that it states that the ink should have "a consistency permitting transference of the ink through inking rolls to the type or die", you understand that? A. Yes, I do.

(968) Q. And that same specification is required of typographic printing inks today, is it not? A. Yes.

Q. And also at the bottom of the second column of page 1 of the Doughty patent it mentions, in line 103, the same thing, that the resin is dissolved in the solvent to produce a vehicle of the desired consistency. That, again, you

understand to be the consistency desired for printing inks generally, is that right, to enable transference from the rolls to the type? A. Yes, although, of course, the patent refers specifically to stamping inks.

Q. Well now, I wonder if it does. Look at the second column of page 2, line 67. It states:

> "The color will depend upon the particular pigment employed which may be other than metallic in character."

Then it goes on to say:

> "The ink described, though particularly suitable for bookbinders' use, will serve other purposes of decorative printing."

Mr. Byerly: I think the witness should have a copy of the patent.

Mr. Free: By all means. I thought he had one.

Q. (Continuing) That statement I just read indicates (969) the ink is not confined to stamping ink, in your opinion, doesn't it? A. Possibly not strictly confined to that.

Q. You know enough about the solvents mentioned in the Doughty patent, such as terpineol, benzyl alcohol, terpinyl acetate, benzyl acetate and ethyl benzoate, to agree with him that they all have a low evaporation rate at room temperature? A. Fairly low, yes.

Q. And also when you heat them the vapor is evolved rapidly and they dry quickly, do they not? That is typical of this whole group of solvents we have just been talking about, isn't it? A. I do not know that you can limit it to this group entirely.

Q. There are more in that group than I have just read to you? A. There are.

Q. Now, will you look at the McElroy patent, No. 1,450,692. You will notice in line 88 of the second column

of page 1 that he lists solvents, such as terpineol, pine oil, rosin-oil, and high-boiling mineral oils. Those are, again, of the class we have been talking about, that is, they are slow or do not have any evaporation rate to speak of at room temperature, but they do evolve and vaporize when heated, do they not? A. Terpineol we have already discussed. Pine oil evaporates fairly readily at room temperature, and, of (970) course, the high-boiling mineral oils will include some that will evaporate fairly rapidly at room temperature and some would practically not evaporate at all.

Q. But they are all of this class that are supposed to be stable at room temperatures, are they not? A. I would not say that pine oil is.

Q. How about rosin-oil? A. Rosin-oil would be stable at room temperatures, but would not evaporate quickly when heated.

Q. If you mixed it with terpineol you would get sort of an average between the two so far as vaporizing characteristics were concerned, wouldn't you, somewhere near the average? A. Somewhere near the average, yes.

Q. If you mixed more rosin-oil than you have terpineol, you get a very slow evaporating mixture, do you not? A. Yes.

Q. And if you mix less than that you get a more rapid evaporating mixture, is that right? A. You would have, depending on the proportions of the two. You might in one case have something that would evaporate faster than you want to and in the other case much slower.

Q. You mix them up the way you want to to get the rate of evaporation that you like, isn't that so? A. You cannot always get an average evaporation rate by (971) making mixtures of that sort.

Q. You understand as stated in the passage beginning with line 60 in the first column of page 2, that he is talking about a mixture of terpineol and rosin-oil "as the con-

stituents preferred of our binder solvent vehicle" in a general way there, isn't he? A. Apparently.

Q. And he gets that mixture to obtain the requisite degree of volatility to be driven off by the temperature used as he states in the second column on page 2, line 68, is that right? A. That is correct.

Q. Down in line 81 of the same column, the second column of page 2, he says:

> "Within the limitations imposed by these criteria, the binder vehicle may be any of the solvents named or suitable combinations thereof."

You notice that? A. I do.

Q. And that, of course, means that you can add rosin-oil and terpineol, or rosin-oil and some of these other solvents, and get anything you like to suit your requirements, is that right? A. If you had an excess of rosin-oil it would behave more as a plasticizer than as a solvent, and you would have practically only the small amount of terpineol as the solvent itself.

Q. But you understand him to include rosin-oil in this (972) patent as a solvent? A. He refers to it that way.

Q. And you would agree with Mr. Taylor, would you not, in the mixture of rosin-oil and terpineol the rosin-oil acts both as a solvent and also as a plasticizer to a certain extent at least? A. It is so slightly volatile that it would have very little of the properties of an ordinary solvent.

(Recess to 2.00 p. m.)

AFTERNOON SESSION.

CHARLES BRAGDON, resumed the stand.

Cross examination continued by Mr. Free:

Q. Mr. Bragdon, we were on the McElroy and Clarke patent, do you remember? A. Yes.

Q. I think you described the example given in lines 16 to 35 inclusive, did you not?

Mr. Byerly: May I furnish him with a copy of that patent (handing to witness).

A. On page 1?

Q. On page 2. A. (After examining) Yes.

Q. And you understand that just to be an example, don't you? He says so in fact. A. He says so.

Q. The idea being that, as he says in line 33, "The ink resulting is of pasty and semi-fluid consistency, similar to that of printing inks generally." A. It so (973) states.

Q. Yes, and then down here in line 44 he says, "The proportions above exampled may be varied somewhat without appreciable variation of the production."

He is still talking about that example up there, is he not? A. Evidently.

Q. Over in the second column of page 2 he describes the ink in general terms there, line 96, where he says, "Preferably, therefore, the described composition should be used as an ink at a temperature substantially that of the boiling point of the solvent vehicle." What do you understand that to mean? A. That means that it is used on a hot die which is heated up to approximately the boiling point of the solvent.

Q. So that the solvent will be driven off quickly, is that right? A. So that the solvent will be driven off, yes.

Q. Then he goes on to say in line 99, "As will be obvious, however, the ink set forth may be used at lower temperatures, or cold, and the impression artificially dried thereafter". Now that describes a modern heat-set press action that we have been talking about, doesn't it? A. I think that is intended to refer still to the use of a stamping iron.

Q. Let us see. He says that he puts the ink in the (974) fountain cold, doesn't he? A. I don't see that he mentions "fountain".

Q. "As will be obvious, however, the ink set forth may be used at lower temperatures, or cold." Now you put ink in a fountain, don't you? A. In typographic printing, yes.

Q. Yes, or almost any other kind of printing ink, don't you? A. Yes.

Q. And that is what you would do with these modern heat-set presses? A. Yes.

Q. And then you print with it, and as he says here, "the impression artificially dried thereafter." That is what happens in a modern heat-set press, doesn't it? A. I do not think that he has the typographic press in mind at all there.

Q. Well, I did not ask you that. I asked you whether or not that statement describes the modern heat-set press action. A. In general it does.

Q. That is, they print the ink cold and then put the paper through a heater and that touches off a solvent and the ink is dried, is that right? A. That is correct.

Q. Now this Cumar situation, I would like to ask you to turn to page 1, the second column, line 66, where he says:

> (975) "Our invention consists in the discovery that a coumarone resin has the desired utilities"

and so forth. That is not limited to any one particular Cumar is it? A. It is not but he has referred in the para-

graph just before to either resin or a neutralized rosin typified by an ester of resin.

Q. Yes. A. Which is a solid resin similar to that hard Cumars, and it would naturally be assumed that he intended to use the same type of coumarone, especially since he mentions the powdered Cumar further down.

Q. Now powdered Cumar is a coumarone resin, isn't it? A. Yes.

Q. And so is the Cumar you were talking about this morning, this viscous Cumar. That is also a coumarone resin? A. It is. It comes in the general class.

Q. And those could be generally called non-acid synthetic resins, could they not, as he says in lines 61 and 62? A. They could be.

Q. Now I wish you would turn back to the Doughty patent again. He says in line 72, the second column of page 1:

> "Solvents boiling materially below 200° C. are unsuitable because the ink dries too rapidly (976) on the rolls and becomes gummy. Solvents boiling materially above 300° C. are likewise unsuitable because the ink cannot be successfully dried except by the application of impracticably high temperatures."

He gives us the two extremes of what he wants there, doesn't he? 200 is the low and about 300 is the high, is that right? A. It sounds to me as though he meant there——

Q. Never mind what he meant. Tell us what you understand that to mean. A. I understand it to mean solvents whose boiling range is within the 200 and 300-degree limit in general.

Q. That is, 200 is the bottom and 300 is the top, is that right, within that range somewhere? A. Yes.

Q. Yes. Now on the second page of the Doughty patent, lines 16 to 20, he talks about using these "paraffin hydrocarbons, for example, those present in fractions of kerosene boiling above 250° C. at normal pressure." Now that is

half way between 200 and 300 that he mentioned, isn't it? A. The 250 point, which would be the initial.

Q. Yes, and then he has the top of 300 which he states on the first page? A. He does not say anything about 300 here. If he took a kerosene of the type that (977) was available in 1922, which had an end point of 300 degrees and fractioned it to take off the part boiling above 250 degrees he would have a residue, the end point of which would be above 300 degrees.

Q. Well, it would be about between 250 and 300? A. It would be about between 250 and possibly 315.

Q. He says, if you will remember, at page 1, line 75, that he wants solvents that do not boil materially above 300, do you remember that? A. I take that to refer chiefly to these that he mentions by name below, such as benzyl alcohol, which are articles of commerce of the essential oil type.

Q. Some substitute of terpineol, for example, in lieu of that? A. Yes.

Q. I call your attention to line 20 of page 2. Let us turn back to that. Let us turn back to where he is talking about kerosene. He says that this kerosene fraction boiling above 250 may be employed instead of terpineol. He means that to be a substitute for terpineol there too, doesn't he? He says so? A. He says so.

Q. So we have a kerosene fraction cut between 250 and 300 described in the patent, do we not? A. As I said before, if you would cut such a fraction from a kerosene having an end point of 300 degrees, (978) you would get a residue which would have a much higher end point because that is the characteristic behavior of petroleum hydrocarbons of the kerosene type.

Q. It is about 315, I think you said? A. Somewhere in that neighborhood.

Q. Then we have, according to the patent, a cut between 250 and 300, which is 50 degrees, or between 250 and 315,

which is 65 degrees, is that about right? A. It could be even higher than that from the kerosenes of 1922.

Q. I will show you Plaintiff's Exhibit 45, and see whether you agree with me or not that the boiling range of what you call 502-C oil, the red curve which I believe—is this yours or Taylor's? A. That is Taylor's.

Q. Let us take yours, the one marked Bragdon. And you have an initial point there of 260? A. That is right.

Q. And an end point of 289, or somewhere around there, is that right? A. Yes.

Q. And that is within the range we have been talking about? A. That is a very much narrower range.

Q. Yes, but it is within 250 to 300 and 250 to 315? A. Within that range, yes.

Q. I do not know whether I understood you to mean that (979) there is a difference between distillation temperatures and boiling range temperatures, is there? A. No, I understand that they are used interchangeably.

Q. The difference is principally where you put the thermometer? A. No, true boiling temperature is usually determined by putting the thermometer in the vapor.

Q. When you put it in the liquid you get a little lower temperature or higher? A. Usually a little higher.

Q. But substantially it is the same, the distillation range and the boiling range? A. Yes.

Q. I think you said you were an employee of the plaintiff company here? A. I am.

Mr. Free: That is all.

Re-direct examination by Mr. Byerly:

Q. You were asked on cross examination about the machine in which the vapor pressure of oil of cassia was measured, in the plaintiff's laboratories; was that the same machine on which the other vapor pressures to which you have referred in your examination, including that of butyl carbitol, were measured? A. It is exactly the same machine.

It employs the same principle as the Brewer and Gardner instrument, but it has some refinements which make it more accurate than Brewer and Gardner's.

Q. Looking at your Plaintiff's Exhibit 5, giving (980) vapor pressure curves for butyl carbitol, if I understand your previous testimony correctly the solid line indicated the values determined by your machine, and these three points here indicated the values obtained by the Brewer and Gardner method by Mr. Taylor, is that correct? A. That is correct, the solid line indicates the vapor pressures that we got after removing just 10 per cent of the original sample that we took.

Q. And your line checks very closely with Mr. Taylor's determination by the other method, does it not? A. It checks almost identically with Mr. Taylor's measurements.

Q. I show you Defendant's Exhibit L-1, which is a picture of the machine used by Mr. Taylor. When this machine is in operation what happens to any vapor that comes off the liquid? A. The vapor that is given off by the liquid in the tube *a*, which is where the vapor pressure is being actually determined, rises and passes over through the side tube *c* into the flask *e*, which is contained in a freezing solution.

The Court: How do you know that? Are you familiar with that apparatus? Have you ever worked with one of them?

The Witness: I have worked with one almost identically like that.

(981) Mr. Byerly: It is described in the literature, your Honor.

The Court: Is that standard mechanism?

The Witness: It is the apparatus described by Brewer and Gardner and which has been very widely used.

Q. I show you a drawing, which I will ask to be marked for identification.

(Marked Plaintiff's Exhib' 61 for identification.)

Mr. Free: It sounds like the opening of a new line on re-direct examination, another different apparatus than we talked about.

Mr. Byerly: It is the same apparatus we talked about all through the case.

The Court: What apparatus is it?

Mr. Byerly: This is the plaintiff's vapor pressure-measuring apparatus.

The Court: It has been referred to heretofore?

Mr. Byerly: Yes.

The Court: Was there anything said about it on cross examination?

Mr. Byerly: Yes, there was. He was asked whether the apparatus in which he measured oil of cassia was not different from the Brewer and Gardner apparatus.

The Court: All right.

(982) Q. Now, is this drawing, marked Exhibit 61 for identification, a drawing of the vapor pressure measuring apparatus in the plaintiff's laboratories? A. It is. It is a schematic drawing showing that apparatus.

Q. The liquid whose vapor pressure is to be measured—A. Is placed in this vessel here.

Q. That vessel 11? A. That vessel 11.

Q. Does that correspond to this flask 1 in the Brewer and Gardner apparatus? A. It does.

Q. What is this graduated tube marked 31? A. That is a tube which is very carefully graduated. Into it any portion desired of the original sample can be distilled and measured accurately.

Q. In the use of the machine is that tube 31 cooled by ice or something like the bulb *c* in the Brewer and Gardner machine? A. It is cooled by a very cold freezing mixture.

Q. But this tube 31 differs from the bulb *c* in the Brewer and Gardner machine, in that it is provided with means

for measuring the exact amount that has been distilled over, is that correct? A. That is correct.

The Court: It has a scale on it?

The Witness: It has a scale on it, yes.

Q. When the measurements are actually made, that is, (983) by reading the vapor pressure—first let me ask you whether this device marked 22, 25, 23 and 24 is a mercury tube for measuring pressure? A. That is. It is called a mercury manometer, and it is the equivalent of two barometer tubes.

Q. There is a similar mercury manometer in the Brewer and Gardner machine shown in Exhibit L-1? A. There is. It is the tube shown at *g*.

Q. When the readings are being made on this manometer in the Brewer and Gardner machine, is this flask 1, which contains a liquid, connected to the tube *g*? A. It is connected with that tube, so that any vapor can distill over during the course of the measurements.

Q. In your machine have you some way of cutting off connection between this tube, 11, where the liquid is, and the trap 31, during the time that you are actually reading the manometer? A. We do have a means of doing that. We have a tube filled with mercury here, connected with the bottom of this U-tube, and the mercury can be forced up into these U-tubes so as to close off this vessel here and leave it connected only to the manometer. The vapor is confined in the space between the surface of the mercury, 22, in the lefthand manometer tube, this flask here, and the surface of the mercury 43 in this mercury seal.

(984) Q. Then is it correct to say that in your machine you have measured the exact amount of liquid distilled off when you have heated this, at such time as you wish, and then prevent any further vapor from going over, and read the vapor pressure? A. That is just what we do.

Q. And in the Brewer and Gardner machine throughout the use of the machine a little vapor is being distilled off, and the machine is read while that has happened? A. That is true, and in order to make these readings accurately it is necessary to read very fast, otherwise the reading changes.

Q. And in your machine you have time enough to make these readings because the vaporization is stopped during that— A. The vaporization is stopped and the apparatus can be held in exactly that same condition as long as desired, without any change. Ours is a static——

The Court: That is all. Just answer the question. Do not volunteer anything.

Q. Would it be fair to say that your machine is a static machine and the Brewer and Gardner machine is a dynamic machine, referring to this difference between the fact that you stop the vaporization while measuring and he does not? A. That is correct.

Q. Is the use of a static machine for measuring vapor (985) pressure referred to in textbooks, do you know? A. It is.

Q. I call your attention to some pages from "Elements of Physics", by Robert Andrew Milliken——

Mr. Free: Your Honor, we heard him say a while ago these apparatuses are essentially the same. Now, we have it they are different.

The Court: This is introducing something new in the case?

Mr. Byerly: I think we brought this out at the start, and Mr. Taylor has actually seen this machine.

The Court: Seen this machine here?

Mr. Byerly: Yes, he has been up there and examined it.

The Court: Did he testify about this machine?

Mr. Byerly: He did not mention it, and we under-

stood from his remarks up there that he was satisfied that it was an accurate way of measuring vapor pressure.

The Court: He did not say anything about it in court.

Mr. Byerly: No, but the reason it is brought in at this time, your Honor, is because Mr. Bragdon testified before that it was measured in this machine, and there has been no criticism of it.

The Court: That would have been the time to have gone into the detail of it when he mentioned it before, (985a) but nothing was said about this by the defendant in their case, so I think it is not proper rebuttal.

Mr. Byerly: I think that it is fair so far, in view of his asking whether the machines were different. Having gone this far I shall go no further.

The Court: All right, let it be admitted in evidence.

Mr. Byerly: I offer in evidence the drawing marked 61 for identification.

(Plaintiff's Exhibit 61 for identification received in evidence.)

(985b) Q. Mr. Bragdon, I call your attention to the Doughty patent at page 2, line 72. What do you understand by the expression "decorative printing" used there? A. That would be printing made with a hot——

The Court: Just a minute. Is this gentleman qualified to answer this question?

Mr. Byerly: Well he was asked about similar statements on cross examination. If he does not know I presume he will say so.

The Court: I can imagine a good deal what decorative printing is like. Anybody can. I don't know that I need an explanation by an expert.

Mr. Byerly: I merely wanted to bring out this.

Q. Is it the same thing as ordinary printing? A. I would say ordinary printing would not be called decorative printing.

Mr. Byerly: That is all.

Re-cross examination by Mr. Free:

Q. These magazines that we have been talking about, they have pictures in them that are made with these processes. Wouldn't they be called decorative? A. I would not call them decorative, no.

The Court: Give us an example of decorative printing—an illuminated Bible?

The Witness: An illuminated Bible.

(1986): The Court: Well that is not print.

The Witness: Or a gilt decoration. It might be applied to a lady's handbag.

Q. How about the pictures of good-looking girls in the advertisements in magazines; isn't that decorative printing? A. Some might consider it so.

Mr. Free: That is all.

Mr. Byerly: That is all.

SIDNEY SATENSTEIN, called as a witness on behalf of the plaintiff in rebuttal, being duly sworn, testified as follows:

Direct examination by Mr. Byerly:

Q. Where do you live, Mr. Satenstein? A. 145 Central Park West, New York.

Q. What is your business? A. Book manufacturing.

Q. With what company are you connected? A. American Book Stratford Press.

Q. Is that a company which prints books? A. Yes, sir.

Q. Have you any connection with a company called the Alchemic Gold Company? A. I was president of that company.

Q. You say you were president of that company? A. That is right.

Q. During what period were you president of it? A. Oh, from its formation in about 1921 to approximately (987) a few months ago.

Q. I show you a copy of the Satenstein patent No. 1,460,391, which was issued to the Alchemi Gold Company for a method of stamping book-bindings and the like. Is that a patent for an invention which you made? And a patent which is owned by the Alchemic Gold Company (handing to witness). A. That is correct.

The Court: Who is the patentee?

Mr. Byerly: This gentleman.

The Court: What is the number of that patent?

The Witness: No. 1,460,391.

Mr. Byerly: That is Plaintiff's Exhibit 33, your Honor. It is already in evidence.

Q. What kind of a machine is shown in that patent? A. It is what is generally known as a Colts Armory or John Thompson press.

Q. Is there any arrangement for heating the die or type which it contains?

Mr. Free: Now just a minute. I would like to know the relevancy or materiality of it. This patent is not in suit here, nor been set up by the defendant.

The Court: Has it been plead?

Mr. Free: No, not by me, not by the defendant.

Mr. Byerly: Your Honor, as it appears from the patents on which Mr. Free has relied, the McElroy

and (988) Doughty patents, they were issued to the Alchemic Gold Company, and this gentleman knows more about how those inks were used, I think, than anyone else.

The Court: Ask him that, but you are asking him about a patent here that is wholly irrelevant, so far as I can see.

Q. Is your company the owner of two of the patents contained in Defendant's Exhibit G, namely, Doughty patent No. 1,439,696 and McElroy patent No. 1,450,692? A. Yes, we are the owners of them.

Q. I show you also a copy of Defendant's Exhibit Q-2, the Doughty patent No. 1,439,695. Is that a patent owned by your company, the Alchemic Company? A. Yes.

Q. Has your company used the inks described in this Doughty patent and in the McElroy patent which I showed you? A. It did; yes, sir.

Q. For what purpose were they used? A. Used them for stamping book-bindings and the like.

Q. What sort of a device did you do the stamping on? A. On Colts Amory press, John Thompson press, Chandler Price press.

Q. Are those presses of the type shown in your patent which I showed you a few minutes ago? A. Yes, they are.

Mr. Free: That has been excluded, your Honor.

(989) The Court: What is?

Mr. Free: He is referring to that Satenstein patent which was excluded.

The Court: Oh, yes; strike it out.

Mr. Byerly: I respectfully except to that, your Honor. It explains how he uses the inks.

Q. Will you describe the type of press on which you used these inks? A. Yes. The inks we used on a press with a swinging platen, the ink was placed in the fountain

or directly to the rollers. The ink rollers would pass over a chase containing the die or other product which was to be transferred to the book cover. Upon application of the swinging platen to the die that was held in the chase an impression of the ink that had been placed there by the rollers was transferred to the cover. The die was heated and the ink would dry on impact.

Q. About what temperature was the die? A. As near as I recall we never could get accurately what it was, but we used to figure it would be somewhere between 350 to 400 or 450 degrees Fahrenheit.

Q. And that die pressed the ink into a cloth or binding of some sort? A. It did.

Q. And where was the die when the ink was drying? A. Did you ask where the die was?

Q. What was the position of the die during the time (990) the ink was drying? A. In the chase.

Q. You have a heated die? A. Yes.

Q. Or a heated type, if you want to look at it that way, which is pressed down against whatever you are printing on? A. No. The platen on which the cover rested was pressed up against the die.

Q. I see. And did the ink dry while it was being pressed between this hot die and the platen? A. During the moment of impact.

Q. When you were using these inks for making book covers was your company also doing ordinary printing on paper? A. Yes.

Q. Did you use these inks, these Doughty and McElroy inks, in ordinary printing? A. No.

Q. Why not? A. We instigated the manufacture and invention of this ink primarily for the purpose of substituting an ink for what was known as imitation flat leaf, gold leaf, bronze leaf, and therefore it was not our prime purpose. We, however, felt that we would have a very big market for an ink that would print as a gold ink, but whatever efforts we made were not very successful to be used as a gold ink printing on paper as distinguished from stamping on paper.

Q. And it was for that reason that you limited its use to this hot stamping ink? A. That is correct.

(991) Q. You weren't successful in using it cold? A. That is right.

Mr. Byerly: That is all.

Cross examination by Mr. Free:

Q. Mr. Satenstein, you did try to print or stamp on paper with these inks, didn't you? A. That is right.

Q. It worked pretty good, didn't it? A. No, sir.

Q. Do you remember when Professor Doughty sent you some size to put on the paper? A. Yes.

Q. And that was to fill the pores of the paper? A. Yes.

Q. So that you could stamp on it? A. Yes.

Q. And after you had so sized the paper you did stamp on it with this Alchemic Gold, did you not? A. That is right.

Q. And you got pretty good results, didn't you? A. Yes.

Q. You do printing now, don't you? A. We do.

Q. Paper that you use usually comes in sized now, doesn't it? A. Not for this purpose.

Q. Well, a lot of the paper that you use is sized? A. Yes.

Q. You know there is sized paper on the market? A. Yes.

Q. Was there sized paper on the market in 1922? A. Some types of sized papers.

(992) Q. But not for your purpose at that time? A. Not for printing. It was for stamping.

Q. And you found that the stamping worked pretty good on sized paper in 1922? A. Yes.

Q. I show you four samples of gold on paper, entitled "The Cart of Many Colors", and ask you if you ever saw that before (handing to witness)? A. Yes, I have seen these.

Q. Who made them? A. They were made in our place.

Q. In your presence? A. They were.

Q. And whose writing is that on the back of those cards? A. That is mine—yes, that is mine.

Q. How long ago were these made? A. Oh, I should say about 20 years ago.

Q. You do printing, don't you, now? A. Yes.

Q. Quite a bit of it? A. Yes.

Q. For a 20-year old job they still look pretty good? A. Proud of it.

Mr. Free: I offer in evidence the samples of Alchemic Gold printing identified by the witness as Defendant's Exhibit S-2.

(Marked Defendant's Exhibit S-2.)

Q. Now you have a series of patents, as I understand it, issued to you by Mr. Doughty? A. Yes.

Q. And he was the professor of chemistry at Amherst? (993) A. That is right.

The Court: Where?

Mr. Free: Amherst, Massachusetts.

Q. You were one of his students, weren't you? A. No.

Q. Well you consulted him on some of your problems? A. That is right.

Q. And he would make up vehicles for inks for you? A. That is right.

Q. And you paid him a royalty? A. That is right.

Q. For every pound of this ink that you sold? A. That is correct.

Q. About how many pounds of this ink did you sell in these 20 years? A. Oh, there was a stretch I should say of about ten years during which we sold probably 5,000 pounds—five to seven thousand pounds a year.

Q. And then you sold out your patents? A. That is right.

Q. In 1933? A. Yes.

Q. And you kept for yourself the use of the ink in the stamping field, did you not? A. We did.

Q. And you sold out the patents in the remaining fields, including typographic? A. Well, we merely withheld for ourselves a license to use that and sell that ink in the same way that we had been selling it.

(994) Q. Yes, but you sold the other fields to this purchaser? A. Sold the patent.

Q. I see. And who was this purchaser? A. Levey & Company—Frederick Levey.

Q. They make and sell what kinds of inks, do you know? A. Inks for the printing field.

Mr. Byerly: I object, unless he has personal knowledge of what the Levey Company is doing.

The Court: Well, let us not go into that.

Mr. Free: I asked him if he knew. That is the scope of my question.

The Court: He just knows the customer. He is not a member of the firm. I will sustain the objection.

Q. I show you a certified copy of an assignment of certain Doughty patents, and ask you if that is your signature under the name Alchemic Gold Company (handing to witness)? A. Yes, that is my signature.

Q. Does that document represent the sale of these patents to the Levey Company? A. To the best of my knowledge, yes.

Mr. Free: I offer in evidence as Defendant's Exhibit T-2 the assignment of the Doughty patents to Frederick H. Levey & Company in the fields of letterpress, offset, lithographic and intaglio printing, as stated in the assignment.

(995) (Marked Defendant's Exhibit T-2.)

Q. Now as I understand it, Mr. Satenstein, this ink that you have been using, which you have called Alchemic Gold, dried on the application of heat? A. Yes.

Q. And that was after the ink was applied to the subject, whatever it was, paper or a book back? A. No, that was simultaneously with the impact of material to be stamped to the die.

Q. Yes, but it was on the paper when it dried, on the paper or book back when it dried, wasn't it? It had to be, otherwise it would not remain on the paper; isn't that right? A. Not necessarily. The hot die was used to evaporate the vehicle and leave the powder and the binder to be applied to the material upon which it was to be stamped, so whether the evaporation went from the paper or from the die I couldn't competently state.

Q. Well anyway the solvent evaporated, went out of the ink? A. That is right.

Q. The solvent was driven off by the heat? A. Yes.

Q. The ink worked pretty good in general, didn't it? A. For its purposes very well, yes.

Mr. Free: That is all.

Re-direct examination by Mr. Byerly:

Q. You never made or sold this ink for any purpose other than stamping, did you? A. No.

(996) Q. So that when you made this assignment of the patent rights, apart from stamping, you were not giving up anything that you had used, were you? A. No.

Q. You were somewhat surprised, were you not, to find that somebody wanted to buy those rights? A. Very much.

Q. Now looking at these prints, Defendant's Exhibit S-2, will you tell us just how those were stamped? A. You want me to tell you whether it is stamped or printed, or do you speak of both?

Q. How did you make those prints? A. We first printed on those that are marked with a filler, a size on onto the paper from the same die, and then we stamped on top of that to register the ink.

Q. Was the die heated? A. The die was heated.

Q. So it was just the same thing you did in stamping book bindings, except that first you printed this sizing over the surface of the paper; is that correct? A. Yes.

Mr. Byerly: That is all.

Re-cross examination by Mr. Free:

Q. The sizing was supposed to fill the pores of the paper, wasn't it? A. Yes.

Q. Otherwise the ink would sink down in and would not work well? A. That is right.

Q. When you sold these patents you had no idea that (997) they were valuable, did you? A. No idea.

Q. It looks like you and Professor Doughty started something in heat-set inks. Would you care to tell us how much you sold the patents for?

The Court: That is wholly immaterial.

Mr. Free: All right, that is all.

Mr. Byerly: That is all.

Milton W. Durham, called as a a witness on behalf of the plaintiff in rebuttal, being duly sworn, testified as follows:

Direct examination by Mr. Byerly:

Q. What is your business? A. Salesman, International Printing Ink Company.

Q. Here in New York? A. Yes.

Q. Did you ever do any work for International Printing Ink Company in the way of testing an ink invented by Mr. Jirousek? A. Yes.

Q. Just tell us what was done in that connection, what you did? A. Do you want the time I started?

Q. Yes, I would like to get the time of that as closely as we can. A. I was told in May of 1932 by my company to work with Mr. Sam Shearer and his associate in the development of the so-called Jirousek ink. We started development in the first week in June, 1932, and (998) I stayed with it every day, with the exception of two or three days probably, until December of 1932.

Q. Did Mr. Jirousek himself work with you during any part of this time? A. Yes.

Q. Have you any idea how much this work of yours in testing this ink cost the plaintiff corporation, how much money they put into that? A. I would say approximately $35,000.

Mr. Free: I do not think that is material, your Honor. Maybe they wasted the money.

Mr. Byerly: We did.

The Court: Strike it out.

Q. When did these tests end? A. In December, 1932.

Q. What success did you have with these tests?

Mr. Free: This man is a salesman. I do not think he is qualified to answer that question.

The Court: What kind of tests were they?

The Witness: These were tests that were run on the press. It was my job to make arrangements for the tests to be made, to secure the pressroom and paper, and go into the pressroom with the makers of the ink.

The Court: Objection overruled.

Q. Just tell us what happened at these tests, and what you finally decided to do about it? A. The first test, I remember, was at the Wilson H. Lee Company, New Haven, (999) Connecticut. It was a four-color job, run two colors, then dried and run the other two on top of the previous two. We made inks at our place of business at 45th Street. They

were taken up to New Haven and put on the presses of Wilson H. Lee. We first ran the first two colors with a gas burner, so-called ribbon burners, and we could not get the inks to dry so that they would not offset. Neither could we overcome the drying of the plates, drying on the rollers, and, as I said before, offsetting in the jogger. In the meantime Mr. Shearer thought he had insufficient heat, and he ordered put on the presses an electrical heater, which was four or five bars suspended over the jogger. After trying for several days to run the inks with this new heater we were not successful and abandoned the job. We then called in the International Printing Company, and they supplied the ink to finish the job, regular oil inks. That was test No. 1. Do you want any more?

Q. I do not know that you need to go into them more in detail, but you tested these inks on various sorts of commercial presses? A. We tested them on the Strawberry Hill Press. They dried on the rollers.

Mr. Free: He calls these Jirousek inks, but he has not told us what is in them.

Mr. Byerly: None of the testimony in Cleveland (1000) about these inks told us what was in them.

The Court: What evidence have you got of this Jirousek ink heretofore?

Mr. Free: I tried to put in some formulas giving the Jirousek ink, and that was stricken over objection. I am merely asking for the same here. He is talking about what he calls the Jirousek ink, and he does not know what it is.

The Court: What is the probative value of this?

Mr. Byerly: Your Honor admitted a considerable amount, practically everything in the depositions. There was not anything in the depositions that showed the composition of the ink, but your Honor said it is a heat-set ink and the depositions can go in. Now here is the identical——

The Court: They were proven to be heat-set inks, and I admitted them.

Mr. Free: Then the witnesses said they had run them on commercial magazines, and they worked fine. We were barred from discussing the formulas, quite properly so.

The Court: You can ask this man for the formulas of the inks that he ran, and then we will know what he is talking about.

Q. Tell us what you know about the formulas of the inks? A. I only know that our ink room at 45th Street (1001) supplied the so-called base inks, and Mr. Jirousek supplied his solvent and he mixed the two in the ink room. I never knew what was in the solvent.

Q. Did he refuse to disclose what was in the solvent that he mixed in as part of the ink? A. Yes.

Mr. Free: All this testimony, therefore, is incompetent, irrelevant and immaterial, because this man does not know what was in the inks.

Mr. Byerly: It is exactly on a par with the testimony taken in the depositions at Cleveland. All the witnesses said they did not know what was in the ink.

The Court: The sole important question about the inks is the solvent used. We have got a case where you are talking about an ink and we do not know what the solvent was, so its effect as a criterion of these other inks wholly fails.

Mr. Byerly: It seems to me the same thing is true of all these depositions that Mr. Free put in in Cleveland, because there was not a bit of proof as to the solvent. If those are stricken out——

The Court: If we made a mistake once we do not want to repeat it.

Mr. Free: At the time these depositions were let in the witnesses said this ink is one which is stable on the press, and when applied and heated it dries

(1002) instantly. This man says that the ink did not do that, and where does that leave us? There is no proof of any kind.

Mr. Byerly: I think your Honor should strike out all the proof in regard to this ink, as the solvent was not disclosed in the proof. The difficulty is that this so-called inventor, Mr. Jirousek, did not disclose the ink to any of the people.

The Court: You mean not disclosed in the patent?

Mr. Free: Yes. The patent is in evidence as one of our exhibits.

The Court: That is sufficient. Is this ink made according to the patent?

The Witness: I do not know, sir.

Mr. Byerly: The witnesses don't know that, because Mr. Jirousek——

The Court: The objection is sustained.

Mr. Byerly: May I very briefly offer to prove by this witness that the plaintiff company went to some expense in the year 1932 to thoroughly test the practicable usability of the ink invented by Jirousek as a heat-dried ink, and found it so unsuccessful that they gave it up. At the same time, your Honor, I should like, on the basis of your Honor's ruling, excluding this testimony, to move (1003) to strike all the depositions offered by the defendant in regard to an ink alleged to have been invented by Mr. Jirousek, because there is nowhere in that testimony any evidence whatever of the nature of the solvent used in that ink.

Mr. Free: May it please your Honor, the depositions were received and offered in strict conformance to plaintiff's *prima facie* case, where they only proved that our ink was stable on the presses and evaporated when heat was applied. It was on the basis that the Jirousek depositions were taken and received, because the witnesses said these inks worked fine on magazines. We printed them commercially. They

were stable on the press, and when heat was applied they dried quickly. This man says that the inks did not work at all, so that is the basis of my objection.

The Court: He did not say whether they were of the type of heat-dried inks or not. I will deny the motion and allow an exception.

Mr. Byerly: That is all.

(1004) ALBERT E. GESSLER, recalled as a witness by the plaintiff in rebuttal, having been previously sworn, testified further as follows:

Direct examination by Mr. Byerly:

Q. Dr. Gessler, when you were on the stand before you described the commercial heat-set inks sold by the plaintiff. Can you tell us now under what names those inks have been sold? A. They have been sold and are still sold under the name of Vaporin.

Q. When you were on the stand before, at pages 159 and 160 of the minutes, you stated that you kept a notebook of your work when you were the chief chemist of the Zinsser Company, and you started to point out how the notebook was arranged but the notebook was not put in evidence at that time. Is that your notebook? A. Yes, it is.

Mr. Byerly: I will ask that the notebook be marked Plaintiff's Exhibit 62 for identification.

(Marked Plaintiff's Exhibit 62 for identification.)

Q. You stated when you were on the stand before that the notebook was arranged by experiments which were given numbers, and under letters for branches of those experiments. A. That is correct; subdivisions.

Q. And that the pages were arranged by date; is that correct? A. That is correct.

(1005) Q. You also said when you testified before that in the year 1930 Mr. Cray of the Cray Printing Company asked you to produce an odorless ink for him, and that in making up an odorless ink——

The Court: Was not this part of your direct examination of him before?

Mr. Byerly: I am just picking up the point at which I was shut off before, at which it was objected that we were bringing out the date of his invention and that was not relevant.

The Court: The date of his invention?

Mr. Byerly: Right.

The Court: That is indicated on the patent, isn't it?

Mr. Byerly: It is before that. An inventor can always prove——

The Court: Does it show when he got the idea?

Mr. Byerly: Yes.

The Court: All right; go ahead.

Q. Now, in taking up this work did you consider a number of different solvents for use in odorless inks? A. Yes, I did.

Q. Can you point out where you listed those in your notebook? A. They were listed under the heading of Experiment 842-B, and I have listed a number of solvents. (1006) and I have listed them with their boiling points.

Q. Did you make up any inks with these solvents, and if so tell us how many inks you made up and what the solvents used in them were, and the dates at which you made them and what you did with them. A. Of the solvents listed in this list of solvents, I selected three solvents specifically. They were butyl cellosolve, carbitol and butyl carbitol, and I made a number of ink varnishes with these solvents using nitrocellulose as the binder or thickener, and I made according to this book six varnishes between the date of June 2nd and June 23rd.

Q. What year? A. 1930.

Q. Are the compositions of those varnishes in your notebook? A. Yes, they are.

Q. Did you make any of these varnishes into ink by adding pigment to them? A. Yes, I did. After having made a number of these varnishes, as I stated, six, I used these varnishes to make inks with them by mixing into the varnishes and dispersing in them pigments.

Q. In addition to the three solvents you referred to, in these inks did you use any plasticizers? A. Yes, I did.

Q. What did you use as plasticizers? A. I used dibutyl phthalate as a plasticizer.

Q. Just tell us under what heading or experiment in your notebook you have listed the compositions of these (1007) varnishes, ink varnishes, that you made? A. They are listed from Experiment 842B-1 through to B-6.

Q. Under what number did you list the composition of the inks which you made from these varnishes? A. They were listed under the heading of Experiment 842-C, from 1 to 10.

Q. What did you do with these inks? A. I sent these inks to the Cray-Finne Company.

Q. When did you do that? A. On the date they were made, or very very shortly afterwards.

The Court: What did you do with them?

The Witness: I sent them to the Cray-Finne Company.

Q. Is this written in German? A. Some of it. May I explain why?

Q. I wish you would explain to me what it means. A. It is more difficult to read a laboratory record in a foreign language than in English, and it is always an added protection, though it makes a perfectly good record.

Q. Did the Cray-Finne Company accept these inks as odorless inks and ask for more of them? A. Yes.

Q. How long did they work with them? A. These inks were started to be sent to Cray-Finne in June, and by July 28, 1930, I had sent them ten inks.

(1008) The Court: You said these were odorless inks that you tried to produce?

The Witness: Correct.

Q. Did you receive any complaints from the Cray-Finne Company in regard to these inks? A. Yes, they complained about the drying of the inks.

Q. Just what was the nature of their complaint? A. They found that when the inks were tried out on the printing press, that when they contained solvents whose volatility was low enough, that they did not dry on the rollers of the press, that they also did not dry very quickly on the paper; and if they were made of solvents whose volatility was higher, like, for instance, the solvents given here, butyl cellosolve or carbitol, then they dried faster on the paper, but they also started to dry on the rollers on the press.

Q. This you say was in the summer of 1930 you sent them these inks? A. Yes.

Q. And when was it you got these complaints? A. In the summer of 1930. I see here that this record is continued, this record 842-C, and inks were sent from July to September, 1930, to the Cray-Finne Company, inks all the way up to the number of 15.

Q. And that went up through September, you say? A. That went up through September, 1930.

(1009) Q. And then it stopped? A. Then we stopped the inks being sent to the Cray-Finne Company.

Q. I show you a letter dated February 17, 1932, which purports to be signed by you; is that a letter which you wrote and signed? A. Yes, I did.

Q. Will you refresh your recollection from that letter and tell us when you again sent any ink to the Cray-Finne Company? A. It says on February 17th that I have sent to the Cray-Finne Company a package containing a tin can

full of ink—no, I beg your pardon, a tin can full of dispersed pigment in the yellow, and a second tin can containing a special varnish "Made for you according to our original sample 842C-5."

Mr. Byerly: I will offer in evidence the letter referred to by the witness.

(Marked Plaintiff's Exhibit 63.)

Q. Had you received any communication from Mr. Cray between the time you stopped sending him these inks in 1930 and the time that you sent him the ink which is shown by this letter? A. Yes, I did.

Q. Just tell us about it. A. Mr. Cray—and I do not remember now was it Mr. Cray or Mr. Finne, I think it was Mr. Cray; it might have been both of them—came to Hastings on the Hudson, which was headquarters of Zinsser & Company who were my employers, and they told (1010) us, or they asked us to again take up this question of these inks that we had worked with them on in the year 1930.

Q. Did they give you any information as to what sort of inks they wanted, in addition to what they told you in 1930? A. Yes, they did. They wanted odorless inks, in the first place, and in the second place, Mr. Cray came out with the remark, or with the observation that he had seen heating units on printing presses, employed on printing presses during that time.

Mr. Free: That is hearsay, and, your Honor, I do not think Mr. Cray's remarks ought to go in at this time.

The Court: Strike it out as hearsay.

Mr. Byerly: If your Honor pleases, we are not trying to prove that they were used, but merely the data that was placed before——

The Court: It is hearsay testimony. He is stating what someone else told him.

Mr. Byerly: I respectfully except.

Q. Did Mr. Cray ask you to furnish him an ink which could be used on a press provided with a heater? A. Yes, he did.

Q. Was it in response to that request that you sent the ink referred to in this letter of February 17, 1932, (1011) Plaintiff's Exhibit 63? A. Yes, it was in direct response to that.

Q. Now will you please refer to your notes in connection with the formula given in the letter, and tell us what that ink that you sent in February, 1932, consisted of? A. The number of the ink, or the symbol of the ink mentioned in this letter is 842C-5. Looking at 842C-5 in this notebook, I find the date must be between June 24th and July 25, 1930, because it belongs in that series, and the ink 842C-4 bears the date June 24th, and ink 842C-7 bears the date of July 25th, so it must have been in that period.

Q. You mean that is when you first made it? A. That is when I first made it, in the year 1930.

The Court: When you first made what?

The Witness: When I made this ink the first time.

The Court: What ink?

The Witness: This ink that I had sent to Mr. Cray.

The Court: Not the odorless ink?

The Witness: Oh, yes.

Q. Was this ink which you sent to Mr. Cray on February 17, 1932, one of the same inks which you had previously submitted as an odorless ink in 1930? A. It was.

(1012) Q. Will you tell us the composition of that ink? A. The ink contained—842C-5—contained 10 parts of dispersed pigment and 7½ parts of varnish 842B-5. Varnish 842B-5, under date June 23, 1930, consisted of 70 per cent butyl carbitol, 30 per cent dibutyl phthalate, and 60 per cent nitrocellulose ¼ second.

Q. Was this one of the inks that Mr. Cray had rejected in 1930? A. It was.

Q. Now why, when he asked you for an ink to be used on a press provided with a heater, did you send him this ink with the butyl carbitol solvent? A. During the time when Mr. Cray had lost his interest for this work, namely, from the end of 1930 to the beginning of 1932, I naturally had not lost my interest in those inks, and I had continued experimenting with them, though not with as much pressure as before, and a number of very important points had formed in my mind concerning these inks, so that when Mr. Cray came out with the request for an ink that can be used on a heated press it instantly occurred to me at that time that these points now came together and made a complete story, a complete solution of the problem.

Q. What were these things that you had been thinking of; I mean how did it happen that your mind hit upon an ink with the butyl carbitol when he told you that he (1013) wanted an ink for heating on a press? A. I would say that four points or observations came together in my mind and formed a recognition at that moment. The first one was that I remember very distinctly how it had been established in the year 1930 in my experiments with Mr. Cray that butyl carbitol as a solvent was the only one that would not evaporate on the rollers and would remain moist on the rollers. I therefore concluded that an ink containing a solvent evaporating faster than butyl carbitol would not be fit to be printed on typographic equipment. As you remember, I had in that time, in 1930 I had inks made of butyl cellosolve, carbitol and butyl carbitol, and as we worked with those inks in the year 1930 Mr. Cray, Mr. Finne and myself—that is supported by entries in this book here—we found that the ink containing butyl cellosolve dried much too fast on the rollers; that ink containing carbitol still dried on the rollers, but that ink containing butyl carbitol did not dry on the rollers. So I knew that I must send an ink to Mr. Cray that had a solvent that would not evaporate faster than butyl carbitol. That was point No. 1.

Point No. 2: During the time when I had not worked with Mr. Cray I had tried to use these inks for printing inks, and had made a number of experiments at that period, applying these inks to tin, as it is printed (1014) on tin cans, and heating them in an electric oven, and in this notebook here you find experiments referring to that. I had noticed in these experiments, trying these inks in an electrical oven, that the evaporation rate increased very fast upon rise of temperature, and I had noticed that butyl carbitol evaporated with great ease in an electric oven from a film on a tin plate.

The third point that I had recognized that I had already suspicioned, perhaps in the year 1930, and that had become extremely clear to me in the meantime, was that I was dealing with extremely thin films. I was not dealing with beakers, with barrels full of material. I was dealing with extremely thin films. I had gained the knowledge that a film of printing ink on a paper is of the thickness of something like 3 to 5 microns. For comparison let me say that 25 microns is a thousandth of an inch, and is about the thickness of the cellophane that is used for wrapping up cigarettes. I knew that printing ink film was very very much thinner than this, than, for instance, the cellophane that is used for wrapping, and I knew and had learned that a solvent contained in such a film would evaporate extremely fast, because obviously very little solvent is in such a film, and it is exposed over a very large surface. I had realized fully that it would not be necessary to heat the (1015) solvent to the boiling point of it, that that was not necessary at all; that a comparatively moderate rise in temperature was enough to drive it off.

Those were the three points I was fully conversant with. The reason my inks in the year 1930 were not a success was that I was constantly trying to find the fine balance between not drying on the rollers and not drying on the paper, or vice versa. And now, when Mr. Cray came, in the year 1932, and told me that heating units,

steam-heated rollers are used on printing presses, that was the last key that I needed for the solution of the problem. I had not known that before, and I knew that if I could apply any heat to the thin film of those inks that they would dry almost instantaneously. With that in mind that was the mental background, I would say, that I sent this particular ink to Mr. Cray. I did not send him a number of inks or a selection of inks, but I sent him just one specific ink.

Q. Dr. Gessler, you have referred to the butyl cellosolve and carbitol, that is, inks containing those, as drying too fast and not staying on the rollers of the press properly. Can you point to anything in your notebook referring to that? A. I think I can. I find an experiment here, experiment 842C-2, which was an ink made of pigment and a varnish made from varnish with the (1016) number 842B-2, which consisted of 100 parts butyl cellosolve and 70 parts nitrocellulose. This experiment refers to this varnish 842B-2, and the remark that this ink dries too fast, the remark is made that this experiment was it dries too fast.

Q. That particular note was written in German? A. That particular note was written in German.

Q. What do you find about the ink which you made from carbitol, which I think you find was experiment 842C-11? A. That is right. That experiment was an ink made of the same pigment as before, and a varnish 842B-4, which consisted of 100 parts of carbitol and 60 parts of nitrocellulose. The remark is that that experiment, whose date is July 31, 1930, says sample sent to Mr. Finne, carbitol used as thinner, and then result no good. Then comes a German remark. The quotation in English is that it would not remain on the plate, that it would not remain on the plate. That is experiment 842C-11.

(1017) Q. Now I call your attention to Defendant's Exhibit G, and contained therein is a 1929 circular or catalog of the Carbide & Carbon Chemicals Corporation. I call your attention to the page giving data as to their various

products. According to this data published by the manufacturer how does the vapor pressure at room temperature compare, that is, the carbitol which you found was unsuccessful to the butyl carbitol which you found satisfactory? A. In this list the vapor pressure of carbitol at 20 degrees Centigrade is listed as .13 millimeters. The vapor pressure of butyl carbitol is listed at 20 degrees Centigrade as .05 millimeters.

Q. That is, carbitol, according to that, has a vapor pressure of twice that? A. Carbitol has a vapor pressure of 2½ times as high, roughly, of butyl carbitol.

Q. I notice you did not use those particular vapor pressure figures in your patent. Why was that? A. The reason is that the Carbide—I got my vapor pressure figures from the Carbide & Carbon Chemicals Company. They first listed the vapor pressure of butyl carbitol which was the one that interested me, specifically at room temperature as .05 millimeters, as I have just stated. In later use of the same catalog they listed (1018) that vapor pressure as smaller than .1 millimeter, and much later, before the patent was issued finally, the Brewer and Gardner article came out which listed the vapor pressure of butyl carbitol as .02 millimeters, but it became quite apparent from this that this vapor pressure data at this low temperature of 20 degrees Centigrade was changed with the method of determination, and that different observers arrived at different values. May I add to it?

Q. Go ahead, surely. A. It was not really important to state the vapor pressure of butyl carbitol in numerical figures as long as it was stated that that was the desirable vapor pressure.

Q. Now, after you sent this butyl carbitol ink to the Cray-Finne Company in February, 1932, did you make any tests or learn of any tests being made to ascertain whether you were correct in thinking— A. Yes.

Q. —that this ink would dry instantly on the paper with a slight amount of heat? A. Yes. I instantly equipped

my laboratory with a steam-heated cylinder, not rotating, just standing still, and all prints of these inks that I wanted to test were passed around the steam-heated cylinder. I was able to give different steam pressures to the cylinder, thereby attaining different temperatures.

(1019) Q. Did you then make any record of what you conceived to be your invention? A. Yes. I was of the belief then, I was impressed that instead of making an odorless ink I had made an invention of a quick-drying ink, and I instantly, or not instantly, within a very short time, sat down to write down a disclosure of what I knew at that time of this particular kind of ink.

Q. I show you a paper apparently signed by you. Can you tell us what that is (handing to witness)? A. It is signed by me. It is a disclosure of this invention dated April 4, 1932, signed by myself and notarized.

Mr. Byerly: I offer this paper in evidence as Plaintiff's Exhibit 64.

(Marked Plaintiff's Exhibit 64.)

Mr. Free: Do you want to exclude this notarial seal at the bottom? Or does that go in?

Mr. Byerly: Let me see the original.

The Witness: I don't know whether it was notarized. It was countersigned.

The Court: We will take a recess for ten minutes.

(Short recess.)

Q. In Plaintiff's Exhibit 64, your disclosure of this invention, you refer to the rapid evaporation of the film (1020) of your ink when it is heated, do you not? A. Yes.

Q. I notice at the top—perhaps you might point out where you refer to that. A. I remember I referred a number of times to the vaporation of a thin film.

Q. When heated? A. That is right. For instance in paragraph 3 it says, "will dry quick enough if exposed to

heat after being printed, by the evaporation of the solvents out of the very thin layer, leaving a very flexible film."

Then in the second last paragraph, the second last line there it says, "but yet drying out from the thin film of the print within a few seconds if exposed to heat, as for instance, by passing over a steam-heated roller."

And in the very last line of that page it says, "out of the thin layer of the print if exposed to heat for a short time."

Q. I notice that this statement of yours, Plaintiff's Exhibit 64, has at the top of it these words, "Amendment to description of July 8, 1930." A. That is correct.

Q. After you had written out this description, Plaintiff's Exhibit 64, did you take the matter up with the patent attorney for your company, the Zinsser Company? A. Yes, I did, very shortly afterwards.

The Court: Whom were you working for then?

(1021) The Witness: For Zinsser & Company, Hastings-on-Hudson.

Q. Is this paper I now show you the description of July 8, 1930, which is referred to at the top of Plaintiff's Exhibit 64 (handing to witness)? A. Yes, it is.

Q. Is there any reference to heating the ink in this description of July 8, 1930? A. No.

Mr. Byerly: I will offer this description of July 8, 1930, as Plaintiff's Exhibit 65.

Mr. Free: I object to it, your Honor. There is no reference to heat in it. It does not add anything to the disclosure of April 4, 1932.

Mr. Byerly: I offer it, your Honor, solely for the purpose of explaining the note at the head of the other paper.

The Court: Objection overruled.

(Marked Plaintiff's Exhibit 65.)

The Court: Where is the date of the notary?

The Witness: Right on the bottom, and here it is notarized (indicating).

The Court: Which one says anything about heat?

The Witness: This one here.

The Court: Where?

The Witness: Right there (indicating), and a (1022) few more times it speaks about it.

Q. You indicated on Plaintiff's Exhibit 64 to the Court as referring to the ink. A. I did.

The Court: You did not state in here what your solvent was, did you?

The Witness: Yes, I did.

The Court: Where? You speak of the characteristics but you did not name butyl carbitol.

The Witness: I did. In the example the solvent, diethylene glycol butyl ether, is mentioned, which is the scientific name for butyl carbitol, which is a trade name.

Q. After you had written the first of these two descriptions, which has been marked Plaintiff's Exhibit 65, on July 8, 1930, did you take steps to apply for a patent? A. I did not get your question.

Q. (Read.) A. Yes—not after the first one; the second one. I took no steps after the first one.

Q. Now you were with Zinsser & Company at the time you wrote out these statements, is that correct? A. That is correct.

Q. When did you first come in contact with the plaintiff, the Interchemical Corporation, formerly called the International Printing Ink Corporation? A. It happened that in the Fall of 1933 there was a luncheon date between (1023) Mr. Goldthwaite, at the time president of the International Printing Ink Corporation, and Dr. Zinsser, president of the Zinsser Company, to which luncheon I was invited.

Q. I show you a letter dated November 22, 1933, which purports to be signed by F. G. Zinsser. Can you recognize that signature (handing to witness)? A. Oh, yes. The signature of F. G. Zinsser, who was president of the Zinsser Company at that time.

Q. And that letter is written to Mr. Goldthwaite, president of the International Printing Ink Corporation? A. That is correct, on November 22, 1933.

Q. From that letter can you fix the approximate date of the luncheon which you attended with Dr. Zinsser and Mr. Goldthwaite?

Mr. Free: I think it is immaterial, your Honor. It is after the date of the patent in suit and I do not see what connection it has.

The Court: What does this prove? The patent was granted. That has not been attacked.

Mr. Byerly: I am simply explaining how the patent got into the hands of plaintiff. I do not know that it is very vital——

The Court: Got into the hands of the plaintiff?

Mr. Byerly: Yes.

The Court: Well, he assigned it to them.

(1024) Mr. Free: Yes. I stipulated that they owned it.

Mr. Byerly: It was assigned first to Zinsser——

The Court: Well, no question was raised as to the way in which it was assigned.

Mr. Free: No.

The Court: We can assume that it was properly assigned and came into their hands by lawful conveyance.

Mr. Byerly: Do I understand that the objection is sustained?

The Court: No. I am just suggesting that you are trying to prove something that is not necessary to prove.

Mr. Byerly: I am merely trying to prove how this gentleman became associated with the plaintiff. It will take about two questions. That will tie it up.

The Court: All right, let us hurry along.

Q. From that letter can you fix the approximate date of the luncheon to which you referred? A. Yes. The date was the 27th or 28th of November, 1933.

Q. At that luncheon did you tell Mr. Goldthwaite of your invention and of the use of your printing ink at the Curtis?

The Court: Did you later assign your rights? To whom?

(1025) The Witness: Well, my rights were originally assigned to the Zinsser Company.

The Court: That is what you want to prove?

Mr. Byerly: Yes.

Q. You assigned your rights to the Zinsser Company? A. I assigned my rights to the Zinsser Company.

Q. At the time you applied for your patent? A. At the time of the application, correct.

Q. Were you employed by the International Printing Ink Corporation as head of their research department soon after this luncheon at which you explained your invention and its use to Mr. Goldthwaite? A. Yes, in the beginning of 1934.

Q. Did you urge him to purchase your application? A. I did.

The Court: We have gone into that. It has been purchased and assigned.

Mr. Byerly: Yes. That concludes that line entirely, your Honor.

Q. Did you disclose to the Carbide & Carbon Chemicals Corporation the fact that you had invented an ink in which the solvent, butyl carbitol, made by them might be used?

A. Yes, I did. I disclosed it to Mr. Davis, vice-president of the company, Dr. Davis.

Mr. Free: What is the question?

(1026) Q. (Read.) A. May I add to that——

Mr. Free: I still object to that. I do not see what is the materiality of that. This company, Carbide & Carbon Chemicals Corporation is not a party here.

The Court: It makes no difference. It is already in.

Q. I show you the catalogs of the Carbide & Carbon Chemicals Corporation beginning with the Third Edition in April 1930, the Fourth Edition May 1931, the Fifth Edition March 1933, the Sixth Edition August 15, 1934, and the Seventh Edition March 1, 1935. Will you please tell us whether any of these Carbide & Carbon Chemicals Corporation catalogs from 1930 to 1935 refer to the use of butyl carbitol in printing ink?

Mr. Free: Well again, your Honor, that is immaterial.

The Court: I do not see the materiality of that. They are not a party to the suit. Whether the catalog mentions it or not makes no difference.

Mr. Byerly: I think they brought in an early catalog and showed that—or rather they implied—well, the letter to Cray-Finne did not get in, did it?

Mr. Free: No, you kept that out.

Mr. Byerly: I will abide by your Honor's ruling on it.

(1027) The Court: I will sustain the objection.

Q. I call your attention to an advertisement of the Carbide & Carbon Chemicals Corporation forming part of Defendant's Exhibit G, which mentions butyl carbitol as among

a considerable number of other solvents. In that advertisement I find the words "Dye solvents in printing and vat dyeing."

The Court: What is that?

The Witness: "Dye solvents"—these solvents here (indicating)—"in printing and vat dyeing."

Q. Can you tell us what that expression means? Are you familiar with the trade use? A. Yes. I am fully familiar with the use. That refers to textile printing. Textiles are printed by solution of dyestuffs in water or solvents.

The Court: What has that got to do with this lawsuit?

Mr. Byerly: We think it has nothing to do with it, your Honor, but the defendant put it in evidence and we would like to show that.

The Court: Oh, the defendant put that in evidence?

Mr. Byerly: Yes, the defendant put it in evidence.

A. (Continuing) So butyl carbitol and the other solvents mentioned here are mentioned as being solvents (1028) for dyes in printing, and it is very obvious that it means textile printing because right afterward it says "and vat dyeing"—vats have a certain class of dyes.

Mr. Byerly: In view of that, your Honor, I should like to bring out the fact that butyl carbitol in the catalog of this corporation is not mentioned in connection with printing—merely to meet that.

The Court: All right.

Q. Now I show you these catalogs from 1930 to 1935 of the Carbide & Carbon Chemicals Corporation, each of which contains a description of butyl carbitol. Will you

please point out whether or not any one of those refers to printing ink in connection with uses of butyl carbitol?

Mr. Free: The same objection as before, your Honor. These were ruled out as not having any probative value here. They are catalogs of some other company.

The Court: Were they ruled out before?

Mr. Free: Yes.

The Court: Did you offer them?

Mr. Free: No, Mr. Byerly offered them once before.

The Court: Then I will sustain the objection.

Mr. Byerly: Your Honor, I think they have a bearing on this advertisement——

(1029) The Court: It may have a bearing but it is really of no probative value. You are making a record here that is getting a little ridiculous, all these little points.

Mr. Byerly: Your Honor, I will ask to have catalogs identified and I will offer to place them in evidence later.

(Marked Plaintiff's Exhibit 66 for identification.)

Q. Have you read over the minutes of the testimony which you gave in this case? A. Yes, I did.

Q. I call your attention to page 184 where the question is given as—this is on cross examination—"The lower vapor pressure solvent dries much slower, doesn't it? A. It dries much slower, that is correct." Did you make that statement? A. No, I don't think I said it.

The Court: What did you say?

The Witness: It dries slower.

The Court: Strike out the word "much" there.

Q. In another place where there is a date wrong——

Mr. Byerly: Well, I think I can fix that with my brother.

The Court: Correct that. We will take your word for it.

Q. Oh, the only other thing—you said in your former (1030) deposition was that you sold both butyl carbitol varnishes and butyl carbitol acetate varnishes to the Manufacturers Printing Ink Company? A. Yes.

Q. Have you checked your records on that? A. I did.

Q. What did you find? A. I find we did not sell them butyl carbitol acetate varnishes but only butyl carbitol carbitol varnishes. That was a mistake.

Mr. Byerly: That is all.

Cross examination by Mr. Free:

Q. I understand, Dr. Gessler, you tried different solvents when you were experimenting with these varnishes? A. I did.

Q. And you name butyl cellosolve, carbitol, and butyl carbitol? A. That is correct.

Q. You tried more than that? A. No, I did not. I tried a number of them.

Q. Half a dozen or ten or so? A. According to these records, I have only records of those three.

Q. What is your recollection? A. Well, as you see from the list given I considered a number of them but out of this list I selected only those three.

Q. Yes. You tried one after another until you found what you wanted? A. No, I don't think so at all.

Q. What did you do? A. I selected from this list those three that I thought would answer this question.

(1031) Mr. Byerly: Oh, your Honor, I forgot to offer this notebook in evidence. I think perhaps before Mr. Free goes further I had better do so.

The Court: All right.

Mr. Byerly: I offer that part of the notebook containing the experiments referred to by the witness.

The Court: It will be admitted.

(Marked Plaintiff's Exhibit 62.)

Q. What I want to get straight in my mind, Dr. Gessler, is this: You selected these three, is that right? A. That is right.

Q. Did you select them from a much longer list? A. That is right.

Q. And before you selected them you tried them all out, did you? A. No. You see the list is listed according to the boiling point, and if you followed on I took it from a certain boiling point on upwards.

Q. Oh, I see. You took them out of a long list in accordance with their boiling point? A. That is correct. That was my first indication of evaporation rate.

Q. And you tried butyl cellosolve and that did not work so well, is that right? A. I stated that in one of the experiments.

Q. Yes, and you tried carbitol and it did not work so well? A. That is right.

(1032) Q. And finally you hit on butyl carbitol? A. Yes, I used butyl carbitol.

Q. Now this property of butyl carbitol, of low vapor pressure at room temperature and rapid evaporation when heated, say, above 100 degrees, is a property of the stuff itself, isn't it? A. Yes, it is a characteristic.

Q. Inherent in the butyl carbitol? A. Inherent in the butyl caribtol and perhaps similar other solvents.

Q. It is also inherent in diethylene glycol, isn't it, that same property? A. It is.

Q. And maybe a couple of other ones? A. Maybe some others.

Q. Did I understand you to say on your *prima facie* case before that you did not think diethylene glycol was a good substance for making an ink out of? A. Yes. I said so and I gave the reason why.

Q. In going down the list of solvents in the catalog of Carbide & Carbon Chemicals Corporation you did not select the diethylene glycol? A. You mean I did not see it or what?

Q. Did you see it on a list? A. I knew it. I was familiar with diethylene glycol anyway.

Q. But you did not pick that as one that was useful? A. No.

Q. Why didn't you? A. Because I knew how hygro- (1033) scopical it was.

Q. Did that Carbide & Carbon Chemicals' catalog— A. May I tell you why I knew that?

Q. Yes. A. It happened for years before that I had been working on the dispersion of pigments by means other than mechanical means—chemical means. The idea was to disperse pigments in varnishes for printing inks or for lacquers without mechanical grinding, and for years I had gone through that. I had also applied those dispersed pigments with nitrocellulose—and you will find that in my records—to textiles, and I found that no inks containing nitrocellulose and diethylene glycol were stable. I could prove that very easily.

Q. I will take your word for it. In selecting these three solvents that you referred to, butyl cellosolve, carbitol and butyl carbitol, did you have reference to a Carbide & Carbon Chemicals Corporation catalog? A. I knew them. I don't know if I had reference, but I knew naturally those solvents.

Q. You may have referred to a catalog? A. I may have, certainly. I most probably had the catalog.

Q. You got copies of their catalogs, did you? A. Oh, yes.

Q. Do you recognize the catalog that you might have seen as this one, January 1929 (handing to witness)? (1034)

A. It might have been, I don't remember. I think there is a later one—well no, in the year 1930. That was most probably the catalog I referred to if I referred to any. That is pretty obvious.

Q. As a matter of fact it was published January 1, 1929? A. And the next one—may I ask when the next one was published?

Q. I will tell you. (Examining.) April 15, 1930. I will show you that catalog (handing to witness). A. Well, that might have come up in there, too, because that was right in that period. It is even probable that I used the 1930 one because that was published just before I started my experiments. Most probably I had the latest catalog. That is possible. However, I cannot tell.

Q. On the fly-leaf of the Carbide & Carbon catalog there is a list of their products. Do you remember that list (handing to witness)? A. A similar list.

Q. That gives boiling points and vapor pressures? A. It does.

Q. And you may have selected these three solvents that we are talking about from that list? A. That is possible, although I knew the solvents. I was very conversant with them. I told you a while ago why.

Mr. Free: I offer in evidence as Defendant's (1035) Exhibit U-2 the 1930 catalog referred to by the witness.

(Marked Defendant's Exhibit U-2.)

Q. As I remember, when you experimented with heat after you received that letter from Mr. Finne on February 17, 1932, you had a steam cylinder? A. That is right.

Q. And you tried different temperatures? A. That is right, different temperatures.

Q. And finally hit upon the temperature which would work on butyl carbitol, is that right? A. Well, you see

there are two elements coming in the drying of an ink film, and that is the time of contact and the temperature. They are naturally very closely related.

Q. You got that by experimenting, did you? A. Yes, certainly.

Q. Now will you refer to your Exhibit 65, the July 8, 1930 disclosure. In the middle of the third paragraph you talk about an ink. A. Yes.

Q. Which "does not harden or thicken on the printing rollers." A. That is right.

Q. "but notwithstanding this, will dry quick enough if exposed to heat after being printed, by the evaporation of the solvents out of the very thin layer." How long would that take without heat? A. I think I have a (1036) sentence in this—if I may just read through that, the first part of that.

Q. Yes, please do. A. It says here in the next paragraph, paragraph 4, the last two lines, "but yet are volatile enough to evaporate quickly from the thin film of the print if exposed to heat for a short time"—if spread in a thin film of printing.

Q. And down near the end of the second last paragraph it states, "but drying on paper within an hour." Is that the measurement of the time of drying that you had in mind? A. Where do you find that, may I ask?

Q. Down here (indicating). A. Oh, yes, "drying on paper within an hour." Evidently that is right.

Q. Now in referring to this Carbide & Carbon catalog entitled "Custom-built solvents"—this is an advertisement, rather, dated April 1931—you did not mean to give us the impression, did you, that your ink was not appropriate for printing on textiles? A. It says here "as a dye solvent." There is no dye in my ink, and it is not a solvent for a dye.

Q. In line 35 of the first column of page 2 of your patent in suit you include "dyestuffs" in the list of those that you want to use. A. Yes.

Q. It says, "yellow pigments may be replaced by any (1037) suitable pigments or dyestuffs." A. Yes.

Q. Is that any different from the dye that you referred to a while ago in this Carbide & Carbon Chemicals Company advertisement of April 1931? A. Well, does that paragraph refer to textile printing? Because that is very obviously textile printing.

Mr. Byerly: I think the witness should have a copy of the patent if he is going to be questioned about it.

Mr. Free: Well, I am showing it to him.

Q. Here (indicating). A. I see it.

Q. Your patent does refer to textiles in line 37 of the second column of page 2? A. Does it refer to "with dyes"?

Q. "Very satisfactory prints upon many other surfaces, such as for instance textiles or metallic surfaces," and so on. A. But it does not say that it would be dyes on textiles, does it?

Q. You say here in line 35 of the first column of page 2 that you can use dyestuffs, do you not? A. You see, it says—may I explain that to you? It says here, "suitable pigments or dyestuffs and/or mixtures thereof." I made some of these inks from black inks—we used some black dye to reinforce our pigment in small quantities.

Q. Oh, this reference to "dyestuffs" has to refer only (1038) to black inks, is that what you mean? A. Well, that is the only way that we used it.

Q. These dyes referred to in "Industrial Engineering Chemistry, April 1931" are also dyestuffs, are they not? A. They are also dyestuffs.

Q. And dyestuffs mentioned in your patent you also have used on printing of textiles, as you say; isn't that so? A. Yes—well, it may, but I don't know.

Q. You don't know what you meant in your patent? A. No, no. I say I never tried dyestuff ink of that nature on textiles.

Q. So you never tried printing with your ink on textiles? A. Yes, but while it contained pigment, not dyes.

Q. So you distinguish between pigments and dyestuffs? A. Certainly.

Q. How does it differ between a pigment ink and a dyestuff ink? A. Well, a pigment stuff is not soluble. Dyestuff is soluble, like sugar in water, but sand is not soluble in water.

Q. When you have a dyestuff ink you have a thin ink, don't you? A. Not necessarily.

Q. What gives you the body of the dyestuff ink? A. Any kind of a thickener.

Q. For example? A. For instance,—you mean in (1039) ordinary textile printing?

Q. Take the ink that you have reference to in the patent in suit. A. Well, the nitrocellulose would be a thickener.

Q. That is an ink made up with the dyestuff in it, as I understand it, nitrocellulose and dye, that you just described, is that right? A. That could be an ink like that.

Q. And that can be used for printing on textiles as well as on paper? A. You asked me that before and I said I do not know.

Q. You never tried it? A. No, I only tried pigment inks.

Q. Some of these other solvents that we referred to in this Carbide & Carbon catalog, like diethylene glycol, they also have a narrow boiling range? A. Oh, yes.

Q. That is characteristic of the glycol ethers? A. Characteristic of any pure chemical compound.

Mr. Free: That is all.

Mr. Byerly: That is all.

(Adjourned to January 27, 1943, 10:30 a. m.)

(1040) New York, January 27, 1943;

10:30 o'clock a. m.

TRIAL RESUMED.

Mr. Byerly: If your Honor pleases, I had two more witnesses on my rebuttal and both of them have fallen sick during the case, but I think I would like to tell you about one of them. He lives in Haddonville, New Jersey, which is near Philadelphia. He was supposed to be here yesterday afternoon. He telephoned me yesterday morning that he was sick in bed with a fever. I sent an employee of my office over to check on the situation and found that he had a cold on his chest and his doctor told him he could not go out yesterday, and I telephoned him this morning and he said he was feeling better and that he can be here by two o'clock this afternoon. The testimony won't take more than, I presume, half to three-quarters of an hour, and I would like to ask your Honor's indulgence to continue until two o'clock for this witness. I think that will not prevent us from summing up this morning.

The Court: Is there any objection?

Mr. Free: Yes, I do not see how we can sum (1041) up completely unless we have all the testimony in.

The Court: What would this witness testify to?

Mr. Byerly: This witness will testify as to the state of the art. In Exhibit G Mr. Free has put in, as bearing on the state of the art, a magazine article written by Milton E. Hanson. I propose to call Mr. Hanson to show much more fully than this article does the state of the art,

The Court: Is that the article?

Colloquy of Counsel.

Mr. Free: That is the article, yes. (Handing to Court.)

The Court: The author of this you want to call?

Mr. Byerly: That is right. I think your Honor understands in these patent cases the state of the art is a very vital thing, that is, what knowledge there was at the time of the invention.

Mr. Free: That publication speaks for itself. It is a publication in December, 1931. You cannot change it.

The Court: He does not repudiate it, does he?

Mr. Byerly: He will explain it and give a much clearer view of the art. Of course, part of my rebuttal is to show what the state of the art was. No, he won't (1042) repudiate the fact that he wrote it, certainly.

The Court: Is this witness under subpoena?

Mr. Byerly: Yes.

The Court: I do not think I can continue the case. I have given notice here two or three times that it could not be delayed. Unless you have got another witness ready now, I think we had better close the testimony.

Mr. Byerly: Will your Honor grant an exception on that ruling?

The Court: Yes.

Mr. Byerly: I have one other witness, who is in a somewhat more serious situation, a witness by the name of Decou, who is an employee of the plaintiff in Chicago. Before the trial started arrangements were made to have him here at the trial and he then had to go to the hospital for an operation, and I have here an affidavit of his physician.

The Court: He does not say when he can be here?

Mr. Byerly: He says that he cannot make the trip to New York before the 1st of March.

The Court: Well, we cannot count on him.

Mr. Byerly: This witness testified in an interference proceeding, to which some reference has (1043) been made, and what I wish to get from him was testimony along the line of that which he has already given, and as part of my motion for this continuance I would like to present to your Honor a transcript of what he said in the other case.

Mr. Free: I object to that. We were not a party to this interference. We had no right to cross examine him. We never saw him.

The Court: The objection is sustained.

Mr. Byerly: I respectfully except to your Honor's ruling.

The Court: All this testimony you refer to is more or less cumulative, isn't it?

Mr. Byerly: I think that is true of the witness who was to be here this afternoon, that is, his testimony is not cumulative but bears on the state of the art.

The Court: He is just going to testify and explain the article that was in a publication that is in evidence, isn't that it?

Mr. Byerly: He is going to tell his personal experience in endeavoring to get this sort of an ink at the time he wrote his article. His article indicates the type of ink he wanted, but not the kind of ink he had, and he tried to get it and to make it and was unable to do so. I think that is relevant on the question of the (1044) scope of the invention showing what was the knowledge in the state of the art.

The Court: I think we had better close the testimony and proceed with the motions by counsel.

You may now go ahead and sum up.

Mr. Byerly: Shall I proceed first, your Honor?

Mr. Free: Have you closed your case?

Mr. Byerly: The Court closed it.

Colloquy of Counsel.

Mr. Free: I want to make a motion, your Honor, to strike the testimony of Messrs. Hurley, Busby, Dennerlein, Joy and Hecker, all having to do with this alleged commercial success because the ink which was used by these people was not described by them, they knew nothing at all about it. I asked each of them on cross examination what was in the ink, they did not know. There has been no connection, therefore, between the ink which these people used on their presses and the patent in suit, and it has no connection with this case whatsoever. It does not belong in the case and I think that testimony ought to be stricken for that reason, and I so move.

The Court: I will deny the motion.

Mr. Byerly: Shall I proceed now, your Honor?

The Court: Yes.